CHRONICLING PROCESS INDUSTRY INNOVATIONS SINCE 1966

VOL.56 | ISSUE 5 | MAY 2021



# INTRODUCING FIRSTINDIA

ENGINEERING W

CORROSION RESISTANT SEAMLESS LINING IN COMPLEX SHAPES AND LARGE DIAMETER EQUIPMENTS

www.jasubhaimedia.com



INSTALLATION WITH

CONVENTIONAL

LINING

П

#### FLUOROFIT<sup>®</sup> ADVANTAGE

- Seamless Lining in Complex Shapes
- Full Vacuum Resistance Even in Bigger Sizes
- No Welding Seams or Adhesives
- Reduction of Flange Joints & Leakage Points
- Reduction of Costs & Weight
- Conductive Lining Option Available
- Reduced Residual Tension
- FDA Complaint



PTFE LINED SYSTEMS<sup>™</sup> valves | pipes | fittings | coatings

| PTFE | PFA | FEP | ETFE | PVDF | ECTFE | PP | HDPE | PEEK | PA11/12

INSTALLATION WITH

LINING

**FLUOROFIT® SEAMLESS** 



1102-B, Phase-3, G.I.D.C. Ind. Estate, Vatva, Ahmedabad - 382 445, Gujarat, India. P : +91-079 2583 3040 | 2589 1740 | F : +91-079 2583 3461 | E : hitech@ptfeindia.com

# Leader in Zero Liquid Discharge solutions

End to end solutions provider for WTP/ ETP/ ETP recycling / evaporator based ZLD solutions







Sustainability of the world through circular economy has always been the driving force for Praj to offer innovative advanced process solutions

# **Capabilities**

- Process design
- Detailed engineering
- Manufacturing
- Construction
- Project Management

# Offerings

- > Effluent Treatment plant
- > Effluent Recycling plant
- Zero Liquid Discharge plant (MEE & MVR based)
- > Operation and Maintenance
- Value Added Services

# Industry Segments

- ➤ Refinery
- Mines and Metals (Steel & Aluminium)
- Chemicals & fertilizers
- ➤ Textile
- Food & Beverages
- Pharmaceuticals

# Praj is executing one of the largest ZLD projects on turnkey basis for IOCL, Dumad which will save 4.7 MLD water

**Praj Industries Limited :** "Praj Tower" 274 & 275/2, Bhumkar Chowk, Hinjewadi Road, Hinjewadi, Pune 411057, India | Phone: +91-20-71802000 / 22941000 | Fax: 020-22941299 | Info@praj.net

CHRONICLING PROCESS INDUSTRY INNOVATIONS SINCE 1966

VOL.56 | ISSUE 5 | MAY 2021

# 

# Water & Wastewater Treatment



ChemTECH World Expo 2022 22-25 February 2022 Bombay Exhibition Center



# Technology For High Vacuum Processing

#### High Vacuum Molecular Distillation Plants

(Centrifugal and wiped film types)

- Evaporation areas 0.1 sq. mtr to 10 sq. mtrs
- Process Vacuum upto 0.0001mbar
- M.O.C. SS 316, Titanium, Hastelloy, Carbon Steel

#### **Applications :**

- Pharmaceuticals, Bulk Drugs, Perfumery,
- Flavours, Essential Oils, Fine Chemicals.





## Waste Oil Re-refining Plants & Projects By Thin Film Evaporation

- Approved by N.R.D.C., Govt. Of India New Delhi
- Approved by Central Road Transport Corporation Pune
- Meeting the requirements of Ministry Of Environment
- Several projects established in India and exported to advance countries

#### **Capacities :**

• Throughput : 100 litres per hour to 2,000 litres per hour.



#### ATOMIC VACUUM COMPANY (EXPORTS) • CHEMVAC ENGINEERS

Banglow C-6, "BANGANGA" Govandi Station Road. Opp. USV Limited, Mumbai 400088: India Tel/ fax: 0091-22-25563525, Tel: 0091-22-25570244

Factory: W-145 & 146, MIDC Industrial Area, Taloja-410208, Navi Mumbai-India. Phone: 0091-22-27412940

www.atomicvacuum.com

e-mail:atovac@vsnl.com

Cell: 9820032171 (K.R. Sharma)

# CONCRETE PROTECTION

#### AGRU-ULTRA GRIP<sup>®</sup> FOR THE ULTIMATE GRIP IN CONCRETE

HIGHEST PULL-OUT STRENGTH 50 % higher pull-out strength than conventional concrete protection slabs

RESISTANT TO WATER BACKPRESSURE Water backpressures of up to 1.75 bar are permanently withstood

VERY HIGH NUMBER OF ANCHOR STUDS 420 anchor studs per m<sup>2</sup> are an integral part of the liner

FOREVER SEALED SURFACES >2200 N/stud shear resistance and 82 t/m<sup>2</sup> pull-out resistance for maximum safety

WIDE RANGE OF PRODUCTS Available in PE and PP in widths between 1500 mm and 5000 mm The Plastics Experts.

agr





AGRU Plastic Technology Pvt. Ltd. | 8, Juhu Tara Road, 1. Fl. Ajanta | Santacruz (Westen) - MUMBAI - 400 049 T +91 22 2660 3677 | office@agru.in | www.agru.in

#### CHEMICAL ENGINEERING WORLD RNI REGISTRATION NO. 11403/66

CHAIRMAN Maulik Jasubhai Shah

PUBLISHER & CEO Hemant K. Shetty

**EDITOR** Mittravinda Ranjan

**CREATIVES** Arun Parab

**GENERAL MANAGER SALES** Prashant Koshti Amit Bhalerao

**BRAND MANAGER** Sudhanshu Nagar

#### SALES

Godfrey Lobo Priyaranjan Singh Chandrahas M Amin Yonack Pradeep Sunil Kulkarni

The Publishers and the Editors do not necessarily individually or collectively identify themselves with all the views expressed in this journal. All rights reserved. Reproduction in whole or in part is strictly prohibited without written permission from the Publishers.

#### JASUBHAI MEDIA PVT. LTD.

**Registered Office:** 26, Maker Chambers VI, 2nd Floor, Nariman Point, Mumbai 400 021, INDIA. Tel.: 022-4037 3737 Fax: 022-2287 0502 E-mail: sales@jasubhai.com

**PUBLISHED BY:** 





Dynamic Platform to Connect with Chemical Industry Ecosystem

Direct Reach to >200,000 Readers across >25 countries

sales@jasubhai.com www.jasubhaimedia.com





# **Mist Evaporation System for Zero Liquid Discharge**

#### Environment friendly solution for Liquid Waste Disposal

MREPL is recognized as pioneer of revolutionary Mist Cooling System having more than 30 years experience & over 350 installations in various industries. We now offer an innovative Mist Evaporation System for Zero discharge of effluent/RO reject.



#### Salient features of MES over Conventional Systems (MEE/MVCM)

- ✓ Lower OPEX due to Natural Evaporation.
- Lower CAPEX.
- Negligible maintenance due to choke less design of system and special material of construction.
- ✓ Vacuum and cooling system is not required.
- ✓ No make-up water required.
- MES achieves complete zero liquid discharge as the process does not produce impure condensate which is generated by conventional MEE which is to be disposed.
- Easy to operate.

#### **MREPL** offers Mist Evaporation System in 2 Designs

#### **Open Type Mist Evaporation System for Solar Ponds**





For ZLD requirements where solar ponds can be used , MREPL can guarantee complete evaporation of effluent / RO reject by our high efficiency Mist Creation System installed in Open basin.

#### Mist Evaporation System (Totally Closed with Canopy at Top)

When ZLD requirements are critical, we suggest completely closed Mist Evaporation System with canopy at top. Entire evaporation of pure water takes place in a closed chamber. On top side we place Canopy / Mist Eliminators which allow only pure water to escape from top and avoid carryover of any Mist particles or impurities and also arrest entry of rain water. The balance sludge is removed from the centrifuge.





Mist Ressonance Engineering Pvt. Ltd. Regd Office : 'Anandi', 1304-1/7, Shukrawar Peth, Bajirao Road, Pune - 411 002. INDIA. Tel : (+ 91 20) 2447 2726 / 2447 1184 / 2447 4972 E-mail : mistcreation@gmail.com Website : www.mistcreation.com





# **COVER STORY**

#### **Future Trends & Technologies for Municipal & Industrial Wastewater** Treatment

46

## Non-compliance: Not an Option in Wastewater Treatment



48

50

52

Sunil Chari Joint Managing Director Rossari Biotech Ltd

**Rossari Biotech 'Well Positioned To** 

**Benefit From The Global Tailwinds'** 

## **Fineotex Chemicals Flaring Its** 'Star Export House' Status



**INTERVIEW** 

Sanjay Tibrewala **Executive Director Fineotex Chemical Limited** 

# **GUEST COLUMN**

## **Future Trends And The Use Of Lipids** In Cosmeceuticals

88

92

99



#### Janhavi Dandekar Technical Sales, Personal care division VAV Lifesciences

# **IMPACT FEATURE**



84

**Concrete Protective Liner Protects Tank In India** 

ADVANCED FLOW HULIOT	86
SYSTEMS	

**HTTP & Ultra Silent: Huliot Pipes in Focus** 

# 

104

**A Flourishing Market Analyst of The Chemical Industry: ChemAnalyst** 



**Dr Prashant Gargava** Member Secretary, Central Pollution Control Board Ministry of Environment, Forest and Climate Change Govt. of India

Sudhir Shrivastava (Retd. IAS),

Board Govt. of Maharashtra

Chairman, Maharashtra Pollution Control





Dr Y B Sontakke Joint Director - Water, Maharashtra Pollution Control Board Govt. of Maharashtra

## **Integrated Water Management & Zero Liquid Discharge for Synthetic Yarn Producer**



Ajay Popat President Ion Exchange (India) Ltd.

## **Upgrading The Effluent Treatment System**



JK Saboo **Executive Director** IG Petrochemicals Ltd



# Non-contact radar technology in compact style complete with SDI-12 protocol

80-GHz radar sensors VEGAPULS Series measure reliably in temperature ranges down to -40° C. The non-contact level transmitters are easy to install and require

no maintenance. No matter what the temperature: they remain highly accurate, functioning completely independent of temperature and pressure.

100 dB		 Bluetooth Adjustment
Dynamics		
±2 mm		SDI-12 or
Measurement accuracy		 420 mA/HART or Modbus
80 GHz		Signal output
Transmission frequency		
		 IEC
Process temperature		Approvals
PVDF	VE	 -1 +3 bar
Antenna version	AEI	Process pressure
15m		 <b>8</b> °
Measuring range		Beam angle
	VEGAPULS C 21	(model dependant)

#### www.vega.com/vegapuls

VEGA India Level and Pressure Measurement Pvt. Ltd. Email: sales.in@vega.com



## FEATURES

# Mist Evaporation System For Zero Liquid54Discharge: An Environment FriendlySolution For Liquid Waste Disposal

**Makarand A. Chitale** Director, Mist Ressonance Engg Pvt Ltd

#### Glass Filter Media with AOP Techniques for **60** Removal of Microplastics from Domestic Wastewater

**Nikunj B. Shah,** Research Scholar, School of Chemical Engineering, Dr. Vishwanath Karad MIT World Peace University SVS Aqua Technologies, Pune

**Dr. Kiran D. Patil,** Professor, School of Chemical Engineering Dr. Vishwanath Karad MIT World Peace University, Pune

**Dr. Shilpa P. Kodolikar,** Assistant Professor , School of Chemical Engineering, Dr. Vishwanath Karad MIT World Peace University, Pune

66

72

**Niraj S. Topare,** Assistant Professor , School of Chemical Engineering, Dr. Vishwanath Karad MIT World Peace University, Pune.

#### Case Study: 45 MLD Koyambedu Tertiary Treatment Reverse Osmosis Plant, Chennai

#### Senthilkumar

Chandrasekaran Head - Process & Proposal VA Tech WABAG Limited

#### Natural Waste Water Treatment To Combat Climate Change

**Prof. Rajendrakumar V Saraf** Chairman, Viraj Envirozing India Pvt. Ltd, Pune

PUBLISHED BY:



# AD INDEX

AGRU Plastic Technology Pvt Ltd	.5
Atomic Vacuum Co (Exports)	.4
Fenix Process Technologies Pvt Ltd	17
Hi-Tech Applicator	1
Horizon Polymer Engineering Pvt Ltd	13
JUMO India Pvt. Ltd	.11
Mist Ressonance Engineering Pvt Ltd	7
Praj Industries Limited	. 2
SEW Eurodrive	15
UNP Polyvalves	19
VEGA India Level and Pressure Measurement Pvt. Ltd	.9
AD INDEX	10
NEWS	12
PRODUCTS UPDATES	40
TESTIMONIALS	44
PRODUCTS 1	06



# **Ready for Industry 4.0!**



# Solutions for the Water Industry

- High quality measurement and control components for water, process, and wastewater treatment plants
- Simple, plug and play, modular ecosystem for reliable sensor calibration and comprehensive measuring point management
- PAN India presence with dedicated Sales and Service network

Count on 70 years of quality, a high level of commitment, and excellent industry expertise.

Welcome to JUMO.

# JUMO India Pvt. Ltd.

1021, Spaze Platinum Tower Sector 47, Sohna Road Gurgaon- 122 018, Haryana

Phone: +91 124 498 0169 Email: info.in@jumo.net www.jumo.net



# DNL Surpasses Milestone Of Rs. 1,000 Crore In PBT, In Its 50th Year



Deepak C. Mehta, Chairman & Managing Director Deepak Nitrite Limited

Vadodara, India: Deepak Nitrite Limited, one of India's leading chemical intermediates company, ended its year on a high note, DNL delivered a phenomenal performance in the backdrop of a challenging macroeconomic environment, despite losing one month of production during the year due to nationwide lockdown. DNL's diverse product line and operational excellence continue to be strongholds against widespread uncertainties. Amidst the severity of the second wave, the Company continues to function at a high level of efficiency and make progress on growth initiatives, while adhering to Government directives, local guidelines and safety protocols across all its facilities. DNL has either maintained or increased market share across products.

For Q4 FY2021 vs. Q4 FY2020 Revenues grew by 39% to Rs. 1,469 crore in Q4 FY21. The Basic Chemicals segment has performed well driven by higher contribution from key products. The F&S segment has also been a growth engine for the quarter as favourable absorption by end user industries has driven volumes and realisations higher. In Performance Product segment, DASDA prices are now exceptionally lower after prevailing at abnormally high levels in the same quarter last year. Total Revenue in FY21 stood at Rs. 4382 Crore.

EBITDA was at Rs. 461 crore in Q4 FY21, higher by 75%. The EBITDA margin is higher by 600 bps to 31% led by favorable pricing environment, higher plant efficiency and operating leverage. This would have been even higher, but for the impact of abnormally high DASDA prices in the base period. PAT was Rs. 290 crore in Q4 FY21 higher by 68% as compared to Rs. 172 crore in the same period of last year aided by revenue growth and improved operational and financial efficiency. Consolidated EPS for Q4 FY21 is Rs. 21.27 per share (of face value of Rs. 2 each) as compared to Rs. 12.63 per share in Q4 FY20.

For FY2021 Vs. FY2020 Revenues were at Rs. 4,382 crore in FY21 as compared to Rs. 4,265 crore in FY20, up 3%. The accretive performance of the Phenolics business and that of the FSC segment has driven the performance. The Basic Chemicals segment, which witnessed lower demand for products catering to diesel refining has been able to register good traction in nitration based products. Apart from overcoming impact in the PP segment performance this year due

www.horizonpolymer.com

# HORIZON POLYMER

# India's Largest Processor of **FLUOROPOLYMERS**



**Feflon** 

Valves qualified

ISO 15848-Part 1.

TW

Chemours Co FC LLC - Delaware appoints Horizon Polymer as TEFLON<sup>®</sup> Licensing Partner for India Under Trademark license agreement to promote and sell PTFE/PFA/FEP Lined Piping products using TEFLON<sup>®</sup> PTFE/PFA/FEP Fluoropolymer.

TEFLON and Teflon diamond brand logo are registered trademarks of The Chemours Company FC, LLC used under license by Horizon Polymer Engineering Pvt. Ltd.

#### Horizon Polymer Eng Pvt. Ltd.:

204, Sumer Kendra, Pandurang Bhudhkar Marg, Worli, Mumbai - 400018. India Contact: +91 22 24965031-36 | Fax: +91 22 24961073 Email: vp@horizonpolymers.com



**Pipework qualified** 

ASTM F 1545

to high base of DASDA prices in FY20, the current year's performance is even more resilient given the fact that, there was one month of production loss due to lockdown.

EBITDA grew by 20% to Rs. 1,269 crore in FY21 compared to Rs. 1,061 crore in FY20. The EBITDA Margin was at 29% in FY21 compared to 25% reported in the previous year. Along with FSC segment, products in Phenolics division contributed to high EBITDA margins.

PBT was higher by 29% to Rs. 1,042 crore in FY21, surpassing the Rs. 1,000 crore milestone. This is despite loss of one month of production in FY21 due to the national lockdown. PAT was Rs. 776 crore in FY21 as compared to Rs. 611 crore in FY20, higher by 27% aided by higher revenue, more efficient operations and lower interest cost. EPS for

FY21 was Rs. 56.88 per share (of face value ofRs. 2 each) compared to Rs. 44.80 per share in FY20.

"In April, 2020, we decided that the company would prioritize both lives and livelihoods. That financial targets were exceeded was an unexpected outcome. The company ensured that all its locations operated with the highest attention to man and material safety. We have also taken up the responsibility of vaccinating all our employees and spouses and will continue to look for opportunities to provide succour to the 2,000 families that depend on us," Mr. Deepak C. Mehta, Chairman & Managing Director commented on the performance.

Some key Performance Highlights in Q4 FY21 Vs. Q4 FY20 I Basic Chemicals- The BC segment reported revenues of Rs. 245 crore in Q4 FY21 compared to Rs. 226 crore in Q4 Fine & Specialty Chemicals- The FSC segment revenues grew by 30% to Rs. 206 crore in Q4 FY21 compared to Rs. 158 crore in Q4 FY20 supported by volume increment of 15%. Encouraging demand resulted in better pricing in the FSC segment on a y-o-y basis although it has had to absorb near term cost increase until it can review prices on a quarterly basis with customers .

Deepak Phenolics revenues grew by 77% to Rs. 938 crore in Q4 FY21 compared to Rs. 531 crore in Q4 FY20. Revenue realization for both Phenol and Acetone has increased significantly from last year as a result of healthy demand. Plant productivity initiatives have resulted in utilization levels exceeding 115% of specified capacity in Q4 FY21 Vs. 98% in Q4 FY20. While EBIT soared by 319% Y-o-Y, the EBIT margin stood at 28.5% in Q4 FY21 as compared to 12.0% in Q4 FY20. Improved prices and increased capacity utilization helped performance significantly.

Some major developments include Shri Deepak Mehta, Chairman & Managing Director of Deepak group has been awarded India's Top CEO by Business Today and as Entrepreneur of the Year (EOY) Award 2020 (manufacturing) by Ernst & Young LLP, ICRA Limited and CRISIL both upgraded the longterm rating on bank facilities of DNL from ICRA AA- to ICRA AA and CRISIL M-/Positive to CRISIL AA/Stable. The outlook on the longterm rating has been revised from Positive to Stable, Land development in Dahej-2 is nearing completion on a 55-acre site out of a total of 127 acres.

# TOMORROW'S LIFE CYCLE SERVICES ONLY A SMART CHOICE AWAY!

Right from customised designing to commissioning to online and offline monitoring; all you need is to make a smart choice. Powered by leading edge technology combined with unrivalled expertise, SEW's comprehensive Life Cycle Services offer services and solutions throughout the entire life cycle of the systems delivered by us or equipment using our products. Get in touch with our comprehensive network of service centres and service engineers across 33 locations in India, and drive in SEW LCS to ensure a hassle-free tomorrow.

#### **Range of Services:**

On- & off-line condition monitoring Heath check-ups | Maintenance training | Repair services Spares management advice | Upgradation and retrofit



© +91 96866 24322 Email: marketing@seweurodriveindia.com www.seweurodriveindia.com

Driving the world

# Perstorp Launches Emoltene 100 Pro: A Durable DPHP Plasticizer Based On Renewable Material

Malmö, Sweden: Leading specialty chemicals innovator Perstorp is pioneering in the PVC market with the introduction of a general-purpose plasticizer partly based on renewable raw material using a traceable mass balance concept. Emoltene<sup>™</sup> 100 Pro is a dipropylheptyl phthalate (DPHP) designed to support sustainable sourcing of renewable and recycled raw materials and reduction of carbon dioxide emission throughout the value chain. Facilitating uncomplicated adoption by users, Emoltene 100 Pro is ready to be dropped straight into existing flexible PVC formulations. Users can expect the same performance as Perstorp's existing Emoltene 100 plasticizer, with the added benefit of a lower carbon footprint. Emoltene 100 Pro will be available in two grades, with different levels of renewable content based on mass balance: the first, containing 14 percent is available

"We are proud to add Emoltene 100 Pro to our Pro-Environment products portfolio. We launched the original Emoltene 100 plasticizer back in 2009 and it has ever since proven its performance in terms of durability and flexibility, especially for tough outdoor applications," says Perstorp Business Manager Martin Hansson. "This track record drove us to keep working with the same DPHP molecule, but to give it a more sustainable design, in line with our customers' demands as well as global sustainability trends in, for example, the automotive and construction industries.

now, the second, with 71 percent is expected

to become available in the near future.

Being able to offer a well-known and proven plasticizer with improved environmental properties is an important milestone in futureproofing soft PVC applications."

The renewable content of the first grade of Emoltene 100 Pro is biogas which replaces fossil natural gas as raw material. Emoltene 100 Pro, as well as all Perstorp Pro-Environment products, are certified according to the ISCC PLUS system (International Sustainability & Carbon Certification). Both the mass balance where Perstorp applies both physical and chemical traceability as well as the GHG calculations are certified. Being ISCC PLUS certified also means that our sustainable raw materials are ISCC compliant in all parts of the value chain back to the point of origin. All Pro-Environment customers are also given information about the GHG (greenhouse gas) value of the product.

Over the last few years, Perstorp has significantly expanded its portfolio of 'Pro-Environment' products, made from renewable and/or recycled raw materials, to cover polyols, de-icers, plasticizers, acids, aldehydes and alcohols.

# Numaligarh Refinery Ltd To Use Honeywell Technology To Produce Cleaner-Burning Diesel And Increase Crude Oil Conversion

**Gurgaon, India:** Honeywell today announced Numaligarh Refinery Limited (NRL), a public sector undertaking under the Indian Ministry of Petroleum and Natural Gas, will use UOP technology to produce cleaner-burning diesel fuel in compliance with India's BS-VI emission standards and increase crude oil conversion.

May 2021

16

# Complete Mass Transfer Solutions

World Class Products For All Your Mass Transfer Requirement

If you are looking for innovative design to suit your varied application, we will provide you the same. We are having decades of industrial experience in the field of Process Design, Equipment Design, Process Equipment Manufacturing, System Integration, Plant Design, Plant Modifications, Automation, Project Management and Process Consultancy.

We promise to ensure the prosperity of both the our own Company and our valued customers by providing sharply focused "ADDED VALUE" to every product.



# Your Partner For Total Turnkey Solutions.

Fenix Process Technologies Pvt. Ltd.

K- 6/1, Malini Erandwane Co-op. Housing Society Nr. Deenanath Mangeshkar Hospital Pune - 411 004. India Tel. No.: +91-8237008770 / 72 / 73 Fax No. +91 20 25458454 Email: info@fenix.in Url: www.fenix.in



Mike Banach, Managing Director, UOP India

The Numaligarh Refinery Expansion Project (NREP) will facilitate economic development in the north-eastern states of India by expanding the region's crude processing capacity from the present 3.0 million metric tonne per annum (MMTPA) to 9.0 MMTPA in Numaligarh, located in the Indian state of Assam.

The UOP Distillate Unionfining<sup>™</sup> process will enable NRL to produce diesel that complies with India's BS-VI emission standards, which were implemented last year. The process removes impurities to improve the quality of middle distillate feedstocks that meet increasingly stringent regulations for fuels such as diesel.

"This project with Numaligarh marks the first-ever UOP licensed process unit in an NRL refinery, and it's the first grassroots diesel hydrotreating unit in India using a latest-generation UOP catalyst," said Mike Banach, Managing Director, UOP India. "The Unionfining technology will help NRL increase crude processing capacity and comply with ever-stricter standards for diesel production."

UOP Union fining technology provides flexible solutions to gas oil conversion for ultra-lowsulfur diesel fuel and kerosene production. UOP has licensed more than 370 Unionfining units globally.

The NREP expansion is part of the Government of India's Hydrocarbon Vision 2030 for the northeast Indian states. It also is integrated with a new crude oil pipeline from Paradip in Odisha to Numaligarh in Assam, and a product pipeline from Numaligarh to Siliguri in West Bengal where NRL has its own marketing terminal for product distribution.

NRL, one of the four refineries in oil- and gas-rich Assam, was set up at Numaligarh in Golaghat district of Assam in accordance with the provisions made in the historic Assam Accord signed on Aug. 15, 1985. It was created as a vehicle for speedy industrial and economic development of the region.

# AVEVA and Maire Tecnimont Group Strategically Partner to Take Industrial Digital Transformation to the Next Level

**Mumbai, India:** AVEVA, a global leader in industrial software, driving digital transformation and sustainability, has signed a memorandum of understanding (MoU) with engineering, procurement and construction (EPC) contractor Tecnimont, a subsidiary of

# VALVE SOLUTIONS FOR CORROSIVE APPLICATIONS





CASTING OPTIONS AVAILABLE ASTM A216 GR. WCB

ASTM A351 GR. CF8/CF8M ASTM A494 GR. 4A (CD3MN) HESTALLOY C - 276 LINING OPTIONS AVAILABLE PFA, FEP PVDF ETFE (TEFZEL) ANTISTATIC PFA (CONDUCTIVE)

SIZE RANGE : MANUAL VALVES :  $1{\!\!/}_2{\!\!"}$  to 24" | ACTUATED VALVES :  $1{\!\!/}_2{\!\!"}$  to 24"



VADODARA - OFFICE & FACTORY

5 to 12 PR Industrial Estate, Por GIDC - Kashipura Road, Moje : Kashipura - 391 243, Dist. Vadodara. INDIA Phone: +91 70434 30467/77, 70430 20707 Email : sales.baroda@polyvalve.com

#### MUMBAI - THANE

207, Orion Business Park, Next to Cine Max, Kapurbawdi, Ghodbunder Road, Thane (W) - 400 607. INDIA. Phone: +91 22 2589 6422, 2589 6524 /25 Email : sales.thane@polyvalve.com www.polyvalve.in www.polyvalve.com



Pierroberto Folgiero, CEO , Maire Tecnimont Group

the Maire Tecnimont Group a leader in the global natural resource processing industry, to create new digital predictive and prescriptive maintenance services that drive enhanced business outcomes.

This partnership will extend usage of AVEVA's Asset Performance Management of (APM) solutions across the Maire Tecnimont Group, globally, enhancing plant operability and lowering maintenance costs. This will in turn deliver increased information availability empowering better, more informed decisionmaking, and ultimately improving overall business performance. As part of the agreement, the two companies will work together over a twelve-month period on a defined number of customer projects to promote the application of predictive maintenance technology for critical plant assets.

"Digital transformation is one of the technology drivers most needed to give our industry a much-needed boost. This MoU with AVEVA aligns seamlessly with Maire Tecnimont's strategy for digital transformation: it complements our value proposition which focuses on NextPlant, our new digital services and solutions portfolio that has been designed to fully meet customer's needs, while simultaneously improving our operational model through the creation of digital enablers," commented Pierroberto Folgiero, CEO Maire Tecnimont Group.

"AVEVA's Asset Performance Management suite is well positioned to advance industrial operations of the future. By enabling companies to predict failures before they occur, we are helping to reduce unplanned downtime as well as drive efficiency and safety throughout plant operations. We are excited about the partnership with Maire Tecnimont and look forward to supporting our joint customers in overcoming today's industrial challenges by leveraging human experience with artificial intelligence." commented Kim Custeau, Vice President, Asset Performance Management, AVEVA.

As an EPC contractor and global leader in the transformation of natural resources, Maire Tecnimont will leverage its unique process, automation, and maintenance competencies to supply plant owners with perfectly customized digital products and solutions that are tailor-made for their maintenance needs. The combination of Maire Tecnimont's proven market experience and AVEVA's leadership as an industrial technology provider will deliver improved analytics which in turn will help to reduce inefficiencies, optimize operations, and improve our customer's profitability. With this MoU, Maire Tecnimont Group has reached a new milestone in its digital

20

## **Process Industry's Gateway to Indian Market**









# **30<sup>th</sup> International Exhibition and Conferences**

#### 22-25 February 2022

Venue: Bombay Exhibition Center, Goregaon (East), Mumbai, India



**Scope for** 

Enzymes

**Specialty Chemicals World Expo 2022** 

Agrochemicals Intermediates

Bulk Drugs & Intermediates

Colorants, Dyes & Pigments

Hygiene & Cleaning Chemicals

Agrochemicals & Crop Protection

**Cosmetics & Personal Care Ingredients** 

Adhesives & Sealants

#### Scope for CHEMTECH + Biopharma World Expo 2022

- Refining & Petrochemical products
- Biotechnologies
- Chemical & Pharma Processing Equipment
- EPC Services
- Automation Technologies
- Environment Solutions
- Water & Wastewater Treatment Technologies
- Pumps & Valves
- Pipes & Fittings
- Packaging Solutions
- Material Handling Systems
- Analytical & Laboratory Technologies
- Consulting Services
- Equipment Fabricators

## **Benefits for Exhibitors**

- ✓ Business Interactions: Meet over 800 exhibitors from across the entire value chain of the chemical process industry
- ✓ Strategic alliances: Interact with the entire supply network across the Chemical, Pharma & Biotechnology sectors from a single location
- ✓ Market analysis: Evaluate the Indian consumption market and get feedback with over 25,000 visitors walk-ins over 4 days

## www.chemtech-online.com

#### Organised by: Jasubhai Jasubhai Taj Building Tel: +91-22

#### Jasubhai Media Pvt Ltd

Taj Building, 3<sup>rd</sup> Floor, 210, Dr. D N Road, Fort, Mumbai – 400 001, INDIA. **Tel:** +91-22-4037 3636 | **Fax:** +91-22-4037 3635 | **Email:** sales@jasubhai.com

- Laboratory Chemicals
- Surfactants
- Water Treatment Chemicals
- Catalysts
- Electronic Chemicals
- Flavours & Fragrances
- Contract Manufacturers

#### FACTS & FIGURES - CHEMTECH WORLD EXPO 2019

612	18962	18	85	923	2150
EXHIBITORS	VISITORS	COUNTRIES	SPEAKERS	DELEGATES	STUDENTS



Ahmedabad / Vadodara - 09820544904 | Bangalore - 09892644177 | Chennai / Coimbatore - 09176963737 Delhi - 09818148551 | Hyderabad / Pune - 09822209183, 09823410712

transformation journey, with the activation of a new technology-enabled value stream which is a crucial part of its roadmap. To achieve its drive to become the 'contractor of the future', Maire Tecnimont is enhancing overall value for plant owners through a suite of advanced digital products and services geared towards EPC customers.

## Meghmani Finechem's FY21 revenue up 36%



Maulik Patel, Chairman & Managing Director Meghmani Finechem Limited

Ahmedabad, India: Meghmani Finechem Limited announced its results for Q4 and FY21 which are the first set of results for the Company as an independent entity consequent to the scheme of arrangement under NCLT. MFL received the NCLT order on 3rd May 2021 and is in the process of filing its listing application.

The company has delivered a strong

operating and financial performance despite a challenging environment on account of the Covid Pandemic. The key performance highlights are given below.

FY21 operational highlights include Achieved 100% capacity utilization of chloromethanes within 2 years year of operations. Caustic Soda and caustic Potash operated at 80% and 83% capacity utilisation, respectively. Achieved 57% capacity utilisation of Hydrogen Peroxide in the 1st year of operations.

Successfully commissioned phase 2 of the caustic soda plant

Financial highlights in the Q4FY21 include Revenues 115% higher YOY, driven by higher sales of chlor-alkali (up 98%) and its derivatives (up 183%) , EBITDA margin expansion of 600 bps to 31 %; EBITDA 165% higher at Rs. 80 Crore.

FY21 Revenue 36% Higher at Rs. 829
Cr, Stable EBITDA margin of 32% driven by higher production and cost-efficient operations, Cash profit 12% higher at Rs.
17 4 Cr depreciation higher on account of commissioning of new plants; PAT at Rs 101 Crore.

The company is in the process of expanding capacities of existing caustic soda plant to 400 KTPA from 294 KTPA currently, MFL is also setting up an epichlorohydrin (50 KTPA) and CPVC (30 KTPA) plants at Dahej, both the products are 100% import substitute thus supporting GOI's Make in India initiative. Both the plants on track for commissioning in FY23, The expansion projects are progressing well, and majority of the work has been completed. As of Q4FY21, 60% of Epichlorohydrin project, 40% of CPVC project and 40% of Caustic Soda project was completed. Total Capex for all three projects is Rs. 695 Cr.

Commenting on the results Mr Maulik Patel; Chairman and Managing Director - MFL said, "The last year has been quite challenging and has bought many economic hardships and a host of other constraints for many of us. Throughout the pandemic, our firm has worked tirelessly to fulfill our most fundamental responsibility: supporting our employees, customers, clients, and communities. Despite these disruptions our company showed tremendous resilience and delivered a strong business performance. Our FY21 revenue grew 36% and we maintained a strong EBITDA margin of 32%."

"We are extremely excited about the growth prospects of MFL and its transition as in independent company. We will maintain our focus on cost efficient operations and on the value-added derivatives of ch/or-alkali. Our state-of-the-art manufacturing facilities provide us with a unique strategic edge. The capacity expansion of our existing products along with our foray into ECH and CPVC will catapult us to a higher growth trajectory and at the same time create superior value for our shareholders. Sustainability and strong governance will continue to be our core focus areas and we will be driven by global best standards and practices."

# Asia Spearheads Global Refinery FCCU Capacity Additions Through 2025



Asia is expected to register the highest refinery fluid catalytic cracking units (FCCU) capacity additions globally during 2021 to 2025, contributing about 56% of the total capacity additions by 2025, says GlobalData, a leading data, and analytics company.

GlobalData's report, Global Refinery Fluid Catalytic Cracking Units (FCCU) Outlook to 2025 – Capacity and Capital Expenditure Outlook with Details of All Operating and Planned Fluid Catalytic Cracking Units, reveals that Asia is likely to witness a total FCCU capacity additions of 940 thousand barrels per day (mbd) by 2025. Of this, 620 mbd of capacity would be from new build refineries while the rest is from expansions of existing refineries.

Soorya Tejomoortula, Oil and Gas Analyst at GlobalData, comments: "China, India and Indonesia account for almost entire FCCU capacity additions in Asia by 2025. The FCCU expansion project at the Vadinar refinery in India is the largest upcoming project in Asia with 187 mbd of capacity, which is expected to be added in 2024. Among the new build refinery projects, the planned Yulong refinery

in China is likely to add a capacity of 141 mbd in 2023."

GlobalData identifies Africa as the second highest contributor to the global FCCU capacity additions, accounting for about 26% of the total additions by 2025. The planned Lagos I refinery in Nigeria is the highest contributor in the region with 163 mbd of capacity expected to become operational in 2023.

The Middle East ranks third globally contributing about 6% of the global FCCU capacity additions during the outlook period 2021-2025. Iraq accounts for the entire capacity additions in the region, with 104 mbd of capacity is expected to be added by 2025 from two new build and an expansion project.

## 24

## LANXESS Raises Guidance For Fiscal Year 2021

**Cologne, Germany:** LANXESS is raising its guidance for the full year 2021 following a good first quarter: The specialty chemicals company now expects EBITDA pre exceptionals of between EUR 950 million and EUR 1 billion. Previously, the company had assumed earnings of between EUR 900 million and EUR 1 billion.

At EUR 242 million, EBITDA pre exceptionals in the first quarter came in at the good level of the prior-year quarter (EUR 245 million), which had not yet been significantly affected by the Coronavirus pandemic. Group-wide, volumes in the first quarter of 2021 were above the prior-year level. Growing demand from the automotive sector was a key driver, particularly in the Engineering Materials



Matthias Zachert, Chairman, Board of Management LANXESS AG

segment. This was offset by the effects of weather-related production shutdowns in the United States in the Advanced Intermediates, Specialty Additives and Consumer Protection segments. Moreover, negative exchange rate effects, particularly from the US dollar, and significantly higher energy costs, especially in Germany, had a negative impact.

Group sales in the first quarter of EUR 1.693 billion were at the good level of the previous year (EUR 1.704 billion). Group income from continuing operations also remained stable at EUR 63 million.

"The positive momentum from the fourth quarter has continued and we have made a good start to the new year. We are benefiting from a further increase in demand, particularly in the automotive sector. Operationally, we have thus left Corona behind us and are now very confident about the rest of the year," said Matthias Zachert, Chairman of the Board of Management of LANXESS AG. "Now we are focusing on our growth course and are doing everything we can to ensure that our new businesses quickly develop their full potential."

In the first quarter, LANXESS also pursued strategic growth. In the Consumer Protection segment, the specialty chemicals company completed two acquisitions. With the French biocide specialist INTACE, the company has expanded its range of fungicides for paper and packaging. With the successful acquisition of disinfection and hygiene provider Theseo, LANXESS has significantly expanded its offering for the growth market of animal hygiene.

In mid-February 2021, the specialty chemicals company announced the second-largest acquisition in its corporate history. The acquisition of US-based group Emerald Kalama Chemical will enable LANXESS to open up high-margin new fields of application, such as in the food industry and animal health. The Group expects the transaction to be completed in the second half of the year following regulatory approvals.

The specialty chemicals company has also been involved in the future field of battery chemistry since this year, entering into a cooperation agreement with Tinci, a leading global manufacturer of lithium-ion battery materials, at the end of March. From 2022, LANXESS will produce electrolyte formulations for lithium-ion batteries in Leverkusen under the authorization of the Chinese company.

As of January 1, 2021, the antioxidants and reaction accelerators business was

organizationally reassigned from the Advanced Industrial Intermediates business unit (Advanced Intermediates segment) to Rhein Chemie (Specialty Additives segment). The previous year's figures have been restated accordingly. In addition, the colorant and colorant additives business was transferred within the Specialty Additives segment from Rhein Chemie to the Polymer Additives business unit.

In the Advanced Intermediates segment, sales rose by 1.2 percent from EUR 483 million to EUR 489 million. Good demand led to higher volumes, offset by lower selling prices and adverse exchange rate effects. EBITDA pre exceptionals for the segment came in at EUR 77 million, 6.1 percent below the prior-year figure of EUR 82 million. Higher volumes could not offset the negative price effect, adverse exchange rate effects and a weather-related production shutdown in the United States. The EBITDA margin pre exceptionals fell accordingly from 17.0 percent to 15.7 percent.

In the Specialty Additives segment, sales and earnings did not match the good level of the previous year. A weather-related production shutdown in the United States lasting several weeks and continued weak demand from the aviation industry led to lower volumes. Adverse exchange rate effects also had a negative impact. At EUR 517 million, sales were 9.9 percent below the prior-year figure of EUR 574 million. EBITDA pre exceptionals fell by 18.7 percent from EUR 91 million to EUR 74 million. The EBITDA margin pre exceptionals was 14.3 percent, against 15.9 percent in the previous year.

The businesses in the Consumer Protection segment continued to develop well in the

first quarter of 2021. This development was driven by the continued strong agrochemicals business at Saltigo and good demand for disinfectants at Material Protection Products, mitigated by adverse exchange rate effects. At EUR 290 million, sales were 3.9 percent above the prior-year figure of EUR 279 million despite lower selling prices. EBITDA pre exceptionals rose by 3.0 percent from EUR 67 million to EUR 69 million despite a weatherrelated production shutdown in the United States. The EBITDA margin pre exceptionals reached 23.8 percent, against 24.0 percent in the previous year.

The Engineering Materials segment benefited from the increasingly strong demand from the automotive industry. Sales in the first quarter of 2021 rose by 8.6 percent from EUR 347 million to EUR 377 million due to higher volumes. EBITDA pre exceptionals was up 20.4 percent from the prior-year figure of EUR 49 million to EUR 59 million, despite higher freight and energy costs. The EBITDA margin rose from 14.1 percent to 15.6 percent.

# Solid Development In The First Quarter: SGL Carbon

Wiesbaden, Germany: SGL Carbon's consolidated sales amounted to €241.5 million in the first quarter (Q1/2020 €246.8 million), representing a slight decline of 2%. Currency adjusted, sales were on a par with the prioryear level. In the Automotive lightweight construction sector and in the Semiconductor industry, the company benefited from a recovery in economic activity. In contrast, especially the development in the late-cyclical



graphite business for Industrial Applications Dr. Torsten Derr, CEO, SGL Carbon.

as well as SGL Carbon's solutions business for the Chemical Industry continued to suffer from pandemic-related weaknesses.

EBITDA pre rose by 14% to €33.0 million in the reporting period (Q1/2020 €29.0 million). EBIT also increased significantly to €17.0 million compared to €6.4 million in the first quarter of 2020. In addition, the company now also achieved a positive net result of €6.1 million again compared to minus €4.3 million in the prior-year period.

SGL Carbon's liquidity is of €168.6 million as of March 31, 2021 developed positively compared to the end of the year (€141.8 million). Free cash flow from continuing operations was positive at €24.1 million. SGL Carbon's net financial debt decreased by 5% to €271.5 million as of March 31, 2021 (year-end 2020 €286.5 million). "Our first quarter results show that we are delivering despite the continued headwinds in some of our markets. One key element of this progress is our global restructuring and transformation program, in which we are making very good progress. Also operationally, there are already some areas at SGL Carbon that are seeing increasing demand again and are now coming strengthened out of the crisis. In addition, we are now pursuing a clear 'margin before volume' strategy with which we are focusing on profitability. We fully confirm our guidance for the full year 2021," explains Dr. Torsten Derr, CEO of SGL Carbon.

The financial result improved from minus €9.4 million in Q1/2020 to minus €6.4 million in the reporting period. In particular, lower interest expenses for pensions and lower effects for the compounding of liabilities, as well as foreign currency valuations of intercompany loans led to this positive development.

Due to the increase in EBIT and the improved financial result, earnings before income taxes increased from minus €3.0 million in the prioryear period to €10.6 million in the reporting period.

Reporting segment Graphite Solutions (GS): Dynamic demand from the semiconductor sector

Sales development in the reporting segment Graphite Solutions (GS) in the first quarter of 2021 was slightly below the previous year's level by around 3% (currency adjusted no change) at €108.3 million, but slightly above our expectations. The Battery & Other Energy market segment showed stable development compared with the previous year. In addition, an expected positive sales and earnings effect of around €9 million is included in this market segment in the first quarter of 2021 from the early termination of a contract. The contract termination agreed in March will lead to a corresponding compensation payment, which will be received in the second quarter. The LED & Semiconductor market segment was able to increase sales significantly. In contrast, demand from the Industrial Applications market segment declined significantly in the first quarter of 2021.

Compared with the good prior-year quarter (Q1/2020 €20.8 million), EBITDA pre increased by 10% to €22.9 million in the reporting quarter, mainly as a result of the financial compensation. This led to a temporary increase in the EBITDA margin to 21.1% (Q1/2020 18.6%). In line with the sales development, the Battery & Other Energy and LED & Semiconductor market segments recorded an increase in earnings, while earnings in the Automotive & Transportation market segment increased due to productivity improvements. All other market segments recorded a decline in earnings compared to the prior-year quarter due to lower demand.

Reporting segment Process Technology (PT): Incoming orders from the Chemical Industry point to recovery

Sales in the reporting segment Process Technology (PT) declined significantly in the first quarter by 16% (currency adjusted minus

18%) to €19.3 million (Q1/2020 €23.0 million). The main reason for this was the decline in order intake from all three regions (Asia, Europe and North America) in the previous year due to the pandemic. Following this decline in demand from the Chemical Industry since mid-2020, order intake recovered noticeably in the first quarter of 2021, amongst others due to the conclusion of contracts for synthesis plants.

Reporting segment Carbon Fibers (CF): Automotive business picks up noticeably

At €81.1 million, sales in the reporting segment Carbon Fibers (CF) in the first quarter of 2021 were on the same level as in the previous year (currency adjusted plus 4%) and slightly above expectations. The earnings situation

in the first quarter of 2021 was characterized by the favorable Automotive business, which exceeded expectations and the prior-year figure. Sales in the Wind Energy market in the first quarter of 2021 were slightly below previous year. The Acrylic Fibers business, on the other hand, is characterized by currently volatile raw material prices and shows higher sales due to higher raw material prices, which is attributable to the increased acrylonitrile price. Sales in the other customer industries declined slightly due to portfolio adjustments.

> EBITDA pre in the first quarter of 2021 improved significantly to €13.9 million compared with €10.3 million in the prior-year quarter due to the €3.7 million improvement in income from investments accounted for At-Equity. The EBITDA margin in the reporting segment improved significantly to

17.1 %, compared with 12.6 % in the prior-year quarter.

Reporting segment Composite Solutions (CS): Sales up 24% at the start of the year

The reporting segment Composite Solutions (CS) is strongly affected by the Corona crisis due to its share of sales with the Automotive and Aerospace market segments, which are affected more than average. Due to the recovery in the Automotive market segment and the start of new automotive projects, the first quarter started encouraging. Sales in the reporting segment CS increased significantly by 24% to €28.6 million in the first quarter of 2021 compared to the previous year's figure of €23.0 million (adjusted for currency effects 26%).

EBITDA pre in the reporting segment CS improved to €1.8 million in the first quarter of 2021, compared to minus €0.8 million in the prior-year quarter. Accordingly, the EBITDA margin in this reporting segment increased significantly to 6.3%, compared to minus 3.5% in the prior-year quarter.

Reporting segment Corporate: One-time effects from transformation

As expected, sales in the reporting segment Corporate in the first quarter of 2021 were significantly lower year-on-year (no currency effect). This was due to lower rental income as a result of the sale of land and buildings at the former site in Lemwerder in the previous quarter and lower services to divested businesses.

EBITDA pre in the reporting segment

Corporate decreased significantly year-onyear to minus €5.1 million (Q1/2020 minus €2.0 million) despite savings in the central research department.

Following the sharp economic downturn in 2020, we continue to expect fiscal year 2021 to be characterized by a moderate recovery. This includes the reported effect from the contract termination in the reporting segment Graphite Solutions, and therefore cannot be projected for the full year.

Since the end of 2020, the reporting segment Graphite Solutions has been in the pandemicrelated downturn mainly resulting from the market segment Industrial Applications, which was accompanied by a weak order entry. As reported, we were in a consolidation phase in the first quarter of 2021. As we have already been slowly ramping up production again since the beginning of 2021, we expect earnings to improve slightly over the course of the year due to increasing fixed cost absorption and savings from the restructuring.

In total, we were able to increase liquidity at the end of the first quarter of 2021 compared to year-end 2020. For fiscal year 2021, we continue to expect a capital expenditure budget on the level of depreciation and amortization. Due to the revival of business, we expect working capital to increase in the course of the year. Due to the adjusted presentation of interest paid and received in the cash flow from financing activities, we expect a positive free cash flow in the amount of the reclassed interest item of approx. €20 million.

# Evonik More Confident About Full Year After A Strong First Quarter



Christian Kullmann, CEO, Chairman, Evonik

**Essen, Germany:** Evonik is more positive about its earnings for the year as a whole after posting a strong first quarter. Higher demand worldwide and improved selling prices in the quarter led to an increase in sales and earnings. The three growth divisions - Specialty Additives, Nutrition & Care and Smart Materials - were the main driver, showing significant growth.

"A really good start has made us more optimistic for the year as a whole," said Christian Kullmann, chairman of the board of management. "As well as increasing earnings from last year, we even beat the pre-pandemic earnings from 2019. Our growth strategy is working."

For 2021, Evonik now expects adjusted earnings before interest, taxes, depreciation and amortization (adjusted EBITDA) of between €2.1 billion and €2.3 billion. Previously the bottom end of the forecast range was €2.0 billion. The outlook for sales remains at €12 billion to €14 billion for the year. In 2020 Evonik posted adjusted EBITDA of €1.91 billion and sales of €12.2 billion.

In the first quarter adjusted EBITDA gained 15 percent to €588 million compared with the same quarter in 2020. Compared with the first quarter of 2019 the gain was 9 percent.

Sales rose 4 percent to €3.36 billion in the first three months compared with the first quarter in the previous year. Adjusted net income increased 32 percent to €239 million.

Free cash flow almost tripled in the quarter to €312 million, boosted by the improved business performance, strict management of net working capital and lower tax payments. Free cash flow was also higher than the prepandemic level of €159 million in the first quarter of 2019.

"We posted the strongest first-quarter free cash flow since our stock market listing in 2013," said Ute Wolf, chief financial officer. "Our clear focus on growth in free cash flow is paying off."

Development of the divisions of Specialty Additives- The division's sales rose 6 percent to €907 million in the first quarter. Additives for the coatings industry were in much greater demand in all regions with sales in this area growing considerably. An increase in demand for durable goods boosted sales of additives for polyurethane foams for products such as mattresses or refrigerators. Demand for additives for the construction industry remained robust. Renewable energy products saw significantly more demand, especially in Asia. Adjusted EBITDA increased by 14 percent to €273 million.

Nutrition & Care: Sales at Nutrition & Care rose 4 percent to €780 million in the first quarter. Sales of essential amino acids remained stable. Products for the health and care sector benefited from good demand. In particular, active ingredients for cosmetic applications showed a continued positive development. Adjusted EBITDA improved by 21 percent to €143 million thanks to higher selling prices and active cost management.

Smart Materials- The division's sales improved by 6 percent to €909 million in the first quarter. In the area of inorganic products, the tire silica business benefited from a global economic upturn. Demand for products from the hygiene and care sectors as well as for environmental applications remained robust. The catalyst business benefited from the inclusion of Porocel, which was acquired in November 2020. High-performance polymers saw good demand from the automotive industry. Sales of polyamide 12 powder also increased. Adjusted EBITDA rose 4 percent to €173 million at the division.

Performance Materials: The division's sales fell by 1 percent to €580 million in the first quarter. Sales of C4 products rose as demand increased and selling prices climbed. The business development of the superabsorbents was affected by lower production output as a result of severe weather. Adjusted EBITDA rose from €18 million to €42 million.

30

# JSPL to divest its coal fired power business to reduce emissions



V. R Sharma, Managing Director, JSPL

New Delhi, India: Pursuant to Regulation 30 read with Para A of Part A of Schedule III of the SEBI (Listing Obligations and **Disclosure Requirements) Regulations,** 2015 ("Listing Regulations"), we wish to inform you that Jindal Steel & Power Limited ("JSPL" or "the Company") has accepted a binding offer from Worldone Private Limited ("Acquirer"), to divest its 96.42% stake in Jindal Power Limited ("JPL"), a material subsidiary of the Company. The divestment is in line with JSPL's strategic objective to continuously reduce its debt, focus on its India Steel business and significantly reduce its carbon footprint by almost half as part of its ESG objectives. The equity value is an all-cash offer of Rs. 3,015 crores for 96.42%

stake in JPL including 3,400 MW Coal fired power plants in State of Chhattisgarh and other non-core assets owned by JPL. The divestment is subject to receipt of requisite approvals including approval from shareholders of JSPL, approval from lenders of JPL and JSPL, and such other statutory approvals, consents, permissions and sanctions as may be necessary in line with the extant relevant guidelines. Grant Thornton acted as the Transaction Advisor and ran a comprehensive sale process, reaching out to numerous national & international investors for the asset. Cyril Amarchand Mangaldas, India, acted as JSPL's legal advisor for the transaction. Shri V.R. Sharma, MD- JSPL said, "This divestment is in line with our ESG objectives to be amongst the top 10 lowest Co2 emitting steel companies of the world. It is yet another step towards our vision to reduce debt substantially and create a robust balance sheet for our investors and stakeholders. Looking to the future, JSPL will be a key growth driver in the Indian steel industry and will now focus on undertaking expansion of its Angul steel plant from 6 MTPA to 12 MTPA. Infrastructure spending in India is bound to grow exponentially and JSPL is fully aligned with Gol's vision of achieving 300 MTPA steel production by 2030. We firmly believe in the India growth story and its potential to be an engine of global growth."

31

# Petroleum Minister Flags Off 1st Supply Of Used Cooking Oil-Based Biodiesel From Indianoil's Tikrikalan Terminal



Dharmendra Pradhan, Minister of Petroleum & Natural Gas and Steel, Govt. of India

New Delhi, India: Minister of Petroleum & Natural Gas and Steel, Shri Dharmendra Pradhan, remotely flagged off the first supply of UCO (Used Cooking Oil) based Biodiesel blended Diesel under the EOI Scheme from IndianOil's Tikrikalan Terminal. Secretary, Ministry of Petroleum & Natural Gas Shri Tarun Kapoor and Chairman, IndianOil Shri S M Vaidya, were also present on the occasion.

To create an eco-system for collection and conversion of UCO into Biodiesel and developing entrepreneurship opportunities, Hon'ble Minister of Petroleum and Natural Gas & Steel, along with Hon'ble Minister of Health & Family Welfare, Science & Technology and Earth Sciences, had initiated Expressions of Interest (EoIs) for "Procurement of Bio-diesel produced from Used Cooking Oil (UCO)" on the occasion of World Biofuel Day on 10th August 2019. And such "Expression of Interest" is being periodically released by Oil Marketing Companies (OMCs). In the first phase, 11 EoIs were floated between 10.08.2019 to 09.11.2020 for 200 locations. Publication of EoIs has been extended for one more year up to 31.12.2021, for 300 locations across the country.

Under this initiative, OMCs offer periodically incremental price guarantees for five years and extend off-take guarantees for ten years to prospective entrepreneurs. So far, IndianOil has also issued 23 LOIs for Biodiesel plants with a total capacity of 22.95 Cr Litres (557.57 TPD). Under this initiative, IndianOil has received 51KL of UCO-Biodiesel at its Tikrikalan terminal in Delhi as of 31.3.2021.

Speaking on the occasion, Shri Dharmendra Pradhan complimented the Oil industry on the stellar role they have played to keep the fuel lines running despite the stiff challenges of the pandemic. He also lauded the OMCs for going beyond the usual business imperatives by extending support for medical oxygen supply to the nation in this crisis. Mr Pradhan also appreciated IndianOil's leadership role in smoothening the Liquid oxygen logistics in the country through various initiatives.

Referring to the flag-off of the first supply of UCO-based Biodiesel from IndianOil's Tikrikalan Terminal, Mr Pradhan said, "This is a landmark in India's pursuance of Biofuels and will have a positive impact on

the environment. This initiative will garner substantial economic benefits for the nation by shoring up indigenous Biodiesel supply, reducing import dependence, and generating rural employment". He appreciated the proactive role played by OMCs in this direction and shared that 30 LOIs have already been issued.

Secretary, Ministry of Petroleum & Natural Gas, Shri Tarun Kapoor, while delivering his address, said, "With this flag off, a new era of Bioenergy has been ushered in that will revolutionize the Indian petroleum sector. Feedstock availability in Biodiesel is a challenge, and leveraging UCO can be a major breakthrough that will enable us to reach the target of 5% Biodiesel blending. It will also help divert the unhealthy used oil from the food chain to a more productive purpose". Mr Kapoor also complimented IndianOil for their focused drive on UCO based Biodiesel and for the concerted efforts undertaken to promote the benefits of Biodiesel.

Earlier, Chairman IndianOil Shri S M Vaidya, while welcoming the gathering, said, "IndianOil is committed to contributing to this remarkable drive to retrieve the unhealthy Used Cooking Oil and usher in a revolution through "Randhan se Indhan". We aspire to trace even the last drop of UCO and ensure its conversion to Biodiesel, thereby contributing to a more energy secure, greener and healthier India. This event is yet another significant step towards a Swachh and Aatmanirbhar Bharat". He also shared that IndianOil has started constructing eight Biodiesels plants across Uttar Pradesh, Gujarat, and Madhya Pradesh. Biodiesel is an alternative fuel similar to conventional or 'fossil' diesel. It can be produced from vegetable oil, animal fats, tallow and waste cooking oil. A significant advantage of Biodiesel is its carbonneutrality, i.e. the oilseed absorbs the same amount of CO2 as is released when the fuel is combusted in a vehicle. Also, Biodiesel is rapidly biodegradable and completely non-toxic.

## German Chemists Nominated For European Inventor Award



Dr. Christoph Gürtler , Head of Catalysis & Technology, Max Planck Institute for Chemical Energy Conversion

**Leverkusen, Germany:** Covestro's CO2 technology continues to write its success story. The European Patent Office (EPO) has announced the nomination of the two German chemists, Dr. Christoph Gürtler (Covestro



Prof. Walter Leitner, Director, Max Planck Institute for Chemical Energy Conversion

AG) and Prof. Walter Leitner (Max Planck Institute for Chemical Energy Conversion and RWTH Aachen University), as finalists in the "Industry" category of the 2021 European Inventor Award for their role in developing a new technology for using carbon dioxide  $(CO_2)$ . This technology enables the harmful climate gas CO2 to be used as a valuable raw material for sustainable plastics. Their process deploys chemical catalysts to drive reactions between CO2 and a conventional raw material. This process creates so-called polymers in a more sustainable and economically viable way. CO2 is firmly incorporated in the process.

"This nomination is an important confirmation of our efforts towards making chemistry more sustainable. It shows how crucial patents are for the development process of a technology," says Christoph Gürtler, who is responsible for the development of new processes and products at Covestro. "It is a tremendous honor to be part of the award ceremony on behalf of the interdisciplinary team from product research, process development, marketing and the many other minds driving our invention."

"The plastics industry can make a significant contribution to combating climate change by switching to greenhouse gas-neutral production. To achieve this, we need to break away from petroleum and use alternative raw materials such as CO2", says Dr. Markus Steilemann, CEO of Covestro. "The nomination for the European Inventor Award is an endorsement of our company as a pioneer in this field. I would like to extend my sincere congratulations to the many colleagues, including those at our partners, who contributed to the development of the innovative CO2 technology – a genuine sustainability highlight."

The two nominees, Gürtler and Leitner, have played a significant role in the development and market launch of the platform technology, which originated in the collaboration between application-oriented science and researchoriented industry. Their involvement in a large number of patents related to the use of CO2 is proof of this: together, the two hold over 100 patents on CO2 technology.

Covestro and RWTH Aachen University founded the CAT Catalytic Center in 2007. "The scientific community has long had the desire to be able to use carbon dioxide as a supplier of carbon for plastics. Experts have been working on this issue for nearly half a century," explains Walter Leitner.

CO2 forms chemical compounds only with great difficulty. This is the problem that Christoph Gürtler and Walter Leitner's team had to solve.

The team combined industrial and academic

expertise. A great deal of creativity, perseverance and many experiments with catalysts finally culminated in success. The breakthrough was achieved by precisely controlling the reaction between CO2 and the petroleum-based propylene oxide in the presence of a customized catalyst system. "We collaborated closely to develop the right catalyst that led us to success," says Gürtler.

The resulting so-called polyol was introduced to the market by Covestro under the product name cardyon<sup>®</sup>. It is already being used to produce soft foam for mattresses, for adhesives in sports floors, padding in shoes and in car interiors. Elastic textile fibers are currently on the threshold of market maturity. Research projects have successfully demonstrated that CO2 can also be deployed for insulating materials made of rigid foam and for surfactants, for example in detergents.

The use of CO2 contributes significantly to the circular economy. Replacing conventional crude oil as a carbon source in part with the climate gas CO2 preserves resources. The carbon, in turn, remains in the cycle without being released into the atmosphere. Moreover, initial studies have also shown that this technology makes it possible to produce more recyclable plastics whose components can be more easily recycled. An all-round sustainable innovation.

Launched in 2006, the European Patent Office's Inventor Award distinguishes outstanding European inventors and teams and is one of the most prestigious awards of its kind. The award ceremony will take place online for the first time on June 17 and will be broadcast live on the Internet. Three teams are nominated in the Industry category.

# Praj's Technology Breakthrough For Producing "Bio-Bitumen"



Dr. Pramod Chaudhari,Founder Chairman , Praj Industries

**Pune, India:** Praj Industries India's most accomplished industrial biotech company has achieved yet another milestone by developing innovative technology to produce Bio-bitumen based on lignin. The Netherlands-based Circular Biobased Delta, one of Europe's premier consortia to promote bioeconomy, has approved Praj's Bio-bitumen samples processed from Purified Lignin, as a part of their flagship CHAPLIN program.

Lignin is one of the co-products resulting from the 2nd generation Ethanol plants, paper making and also from Compressed Bio-Gas plants.

Bitumen is a black viscous mixture of hydrocarbons produced by fractionation of crude oil and has wide applications in road

construction and roofing as binder.

Praj has now developed a proprietary process (under patenting) to convert the crude lignin into Bio-bitumen which has potential to replace this fossil based bitumen and offer eco-friendly green bitumen. The binding and viscoelastic property of Bio-bitumen makes it useful for applications in asphalt.

Circular Biobased Delta (CBBD) facilitates cooperation between knowledge centers, public authorities and industry to grow usage of biomass as a raw material in the chemical, construction and packaging industries. Under its flagship program CHAPLIN, it aims at stimulating the development and commercialization of Bio-bitumen as binder for use in asphalt so as to improve the

greening approach in road construction while - reducing CO2 intensity.

Praj had provided Bio-bitumen samples processed from Rice and Wheat Straw as feedstock in their 2G Biorefinery Demo plant in India to CBBD for testing and evaluation. After thorough evaluation and studies in their advanced laboratories, CBBD has approved Praj's Bio-bitumen sample for scale up in Asphalt on a Dutch test strip on the road.

Dr. Pramod Chaudhari, Founder Chairman of Praj said, "We are delighted to receive certificate of approval from Circular Biobased Delta for Bio-bitumen samples produced by deploying our proprietary process technology. We understand that Praj is the first Asian company to have developed Bio-bitumen that has the potential to partially replace bitumen from fossil resources. Bio-bitumen is poised to play a significant role as road construction material while curbing CO2 emissions and boosting Bioeconomy. This reaffirms our strong belief in innovation and technology leadership in the industrial biotech space globally."

Speaking on this landmark development, Dr. Ir. Willem L. Sederel, Chairman of Circular Biobased Delta said, "We are very positive about the results of Praj's Bio-bitumen samples based on our lab trials. We have now requested Praj to provide larger quantity of samples for constructing a road strip for test in the Netherlands. We firmly believe increasing value for lignin derived Bio-bitumen will allow improving the biobased business and stimulate economic activities such as processing of agri residues & its applications, biorefineries, and Bio-bitumen."

Following successful testing of pilot road strip in the Netherlands, usage of Bio-bitumen as a green construction material will open up a new chapter of huge applications potential in bioeconomy.

Thermax Group Net Profit Up By 174% In Q4

Thermax Group posted a consolidated operating revenue of Rs. 1,575 crore (Rs. 1,323 crore) in the fourth quarter of FY 2020-21, up 19%. The quarter witnessed improved profitability owing to higher topline, cost reduction measures taken across the group and better margins in the Energy segment. This has resulted in an increase in profit after tax to Rs. 107 crore from Rs. 39 crore in the corresponding quarter last year, which was impacted due to the outbreak of COVID-19.
The group registered orders in Q4 of Rs. 1,497 crore (Rs. 952 crore) aided by a broad based recovery.

On a standalone basis, for the quarter, the company posted a revenue of Rs. 1,085 crore (Rs. 739 crore) and net profit after tax and exceptional items of Rs. 113 crore (Rs. 41 crore).

For FY 2020-21, the group posted a consolidated revenue of Rs. 4,791 crore compared to Rs. 5,731 crore in the previous year, down 16.4%. Profit after tax and exceptional items for the year was Rs. 207 crore (Rs. 212 crore). Consolidated earnings per share was Rs. 18.34 compared to Rs. 18.87 in 2019-20. Order booking for the year was at Rs. 4,784 crore (Rs. 5,498 crore), down 12.9% and an order balance of Rs. 5,227 crore (Rs. 5,238 crore).

On a standalone basis, from continuing operations, Thermax posted an operating revenue of Rs. 3,131 crore as compared to Rs. 3,215 crore in the previous fiscal, down 2.6%. Profit after tax and exceptional items for the year was Rs. 141 crore, as compared to last vear's Rs. 161 crore. For 2020-21, Thermax Limited registered an order intake of Rs. 3,079 crore (Rs. 4,058 crore) and an order backlog of Rs. 3,484 crore (Rs. 3,569 crore). M.S. Unnikrishnan retired as the MD & CEO of Thermax Group on August 31, 2020, and Ashish Bhandari took over as the new MD & CEO, effective September 1, 2020. The Board recommended a dividend of Rs. 7 per share for 2020-21.

### Yokogawa Obtains Isasecure CSA Level 1 Certification For Prosafe-RS Safety Instrumented System



Yokogawa Electric Corporation obtained ISASecure CSA Level 1 certification from the ISA Security Compliance Institute system, a product in the OpreXTM Control and Safety System family. This is the first time a safety instrumented system has obtained this certification. Yokogawa has long emphasized the importance of cyber security with its safety instrumented systems, and this certification is expected to give customers even greater confidence in the use of this product.

Cyberattacks are on the rise worldwide, and are growing ever more sophisticated. In recent years, a number of attacks have targeted industrial control devices, resulting in lost production and the theft of information. In August 2017, a malware attack on a safety instrumented system was reported, and this has led to a call for enhanced cyber security measures to deal with the threat to these systems, which play a pivotal role in ensuring plant safety.

Yokogawa's ProSafe-RS safety instrumented system is certified for use in safety integrity level 3 (SIL3) applications. With regards to



ProSafe-RS safety instrumented system

cyber security, it has held ISASecure EDSA certification since 2013. Replacing

 this certification program, ISASecure CSA
 certifies compliance with the IEC62443-4-2 and IEC62443-4-11 international standards pertaining to control device security.
 Receipt of this certification indicates that a product has been recognized by a third party as having security controls that conform to these international standards.
 Yokogawa also plans to obtain ISASecure
 CSA certification for the ProSafe-RS Lite
 SIL2 safety instrumented system, which was released in January of this year.

> Through its development of highly-secure control devices and systems as well as the provision of support services, Yokogawa offers its customers a wide range of security solutions. Yokogawa will leverage this certification to accelerate its efforts to enhance the cyber security of its customers'

plant operations. customers in their efforts to transform and grow their businesses.

Developed by the ISA Security Compliance Institute (ISCI), the ISASecure CSA certification program focuses on the security of embedded devices and related components (software applications, host devices, and network devices). The ISCI's members come mainly from the International Society of Automation, and the principal activity of this organization is the promotion of security certification for industrial control systems and control devices. The ISASecure CSA certification program was launched in August 2019, replacing the ISASecure EDSA certification program. It complies with the International Electrotechnical Commission's IEC 62443-4-2 and IEC 62443-4-1 international standards for security in control devices.

Released in February 2005, the ProSafe-RS

safety instrumented system helps to prevent accidents by detecting abnormal conditions in plant operations and initiating emergency actions such as a plant shutdown. TÜV Rheinland, an independent certification body, has certified that ProSafe-RS can be used in SIL3 applications. Unlike conventional safety instrumented systems and distributed control systems, which are regarded as having different roles and functions and operate separately, the operation of ProSafe-RS and the CENTUM integrated control system can be fully integrated. ProSafe-RS is highly regarded by users and has been installed in more than 3,000 projects worldwide (as of April 2021).

Since 2017, Yokogawa has provided a comprehensive set of services, systems, and software packages under the Sustainable Safety Instrumented System concept that helps to ensure continued safety in plant operations.

OpreX is the comprehensive brand for Yokogawa's industrial automation (IA) and control business. The OpreX name stands for excellence in the technologies and solutions that Yokogawa cultivates through the co- creation of value with its customers, and encompasses the entire range of Yokogawa's IA products, services, and solutions. This brand comprises the following five categories: OpreX Transformation, OpreX Control, OpreX Measurement, OpreX Execution, and OpreX Lifecycle. One of the product groups that make up the OpreX Control category is the OpreX Control and Safety System family, which includes the ProSafe-RS. With its various OpreX Control solutions, Yokogawa is able to quickly effect changes for its customers that lead to a transformation in such areas as management and operations, and provides highly reliable control technology that ensures high efficiency, high quality, and safe and stable plant operations.

With the OpreX brand, Yokogawa will deliver integrated solutions that address specific needs and support its .

39

### Adani Total Gas Capex Planned At Rs 1,200 Cr For FY22

Ahmedabad, India: Adani Total Gas is planning a capital expenditure of Rs 1,200 crore to Rs 1,400 crore in FY22, despite disruption in project execution and decline in demand due to COVID-19 pandemic. The company is committed to roll out complete capex plan and the numbers it has committed. The company will compensate for temporary delays which are happening.

Adani Total Gas has work going on some sites, albeit at a slower pace. However, it is typing up with vendors and contractors and expects with plans to ramp swifty. The company had announced plans to invest around Rs 5,500 crore in five years for capital expenditure in 2020.

The company reported a consolidated net profit of Rs 144.08 crore in Q4/FY21 as compared to Rs 121.11 crore in Q4/FY20. The company's consolidated total income grew to Rs 633.65 crore in Q4/FY21 from Rs 502.05 crore in Q4/FY20.

### 10-Year Multi-Product Deal By Hikal With A Key Global Pharmaceutical Innovator Company

**Mumbai, India:** Hikal Ltd, a preferred long-term partner for leading global life



Sameer Hiremath, President and Joint Managing Director Hikal Limited

sciences companies, announced signing multi-year contract with a leading global pharmaceutical company. This contract entails the development and supply of a portfolio of niche APIs over a period of 10 years. The development will start this year and commercial supplies will commence post successful development and plant commercialisation estimated to be in FY 2024 onwards. With this deal, Hikal is entering into a niche area of chemistry and products thereby bolstering its Animal Health vertical. Hikal and its customer will be jointly investing at its Panoli, Gujarat site to setup a multipurpose manufacturing asset for manufacturing of these API's

40

**PROJECTS UPDATE** 

Commenting on this development, Mr. Sameer Hiremath, CEO, Hikal said, "We are very excited to be working with one of the leading global innovator pharmaceutical companies who have entrusted us to supply them with a strategic portfolio of APIs. We worked very closely with our customer to provide them a sustainable long-term competitive solution for their product portfolio from early-stage development to commercial supply. Hikal and our customer will be partnering in setting up a manufacturing facility to maintain security of supplies for the next ten years. We are seeing multiple opportunities from several new and existing customers who are looking to diversify and de-risk their existing supply chain."

### Board Of Indo Rama Synthetics Approves Capex Plan Up To Rs 600 Crore

**Mumbai, India:** The Board of Directors of Indo Rama Synthetics, India approved a capex plan worth up to Rs 600 crore for the firm and its wholly owned subsidiaries in Butibori, Nagpur, to add balancing equipment for value addition, manufacture specialty yarns including recycled filament yarns, and build a 700 TPD PET Resin production facility to broaden the business's product portfolio.

#### Andhra Pradesh Govt Selects Essar Steel To Build Steel Plant

**Kadapa, India:** The Andhra Pradesh government has decided to select Essar Steel as the joint venture (JV) partner for building up a three million tpa capacity steel plant in Kadapa district.

The State Cabinet cancelled its previous resolution, made on 23 February 2021, selecting Liberty Steel India as the JV partner for construction and development of the YSR Steel Plant.

The SBICAP asked the YSR Steel Corporation, the special purpose vehicle (SPV) of the state government, that its earlier recommendation be reviewed and proceed with the next qualifying applicant Essar Steel.

The Cabinet considered the proposal and accepted SBICAP's recommendation to select Essar as the JV partner. The project capex of the project is Rs 11,606 crore.

The government established the YSR Steel Corporation for development and operation of a new steel plant in Kadapa district and invited proposals in November 2020 from renowned companies for inducting as a JV partner.

A three million tpa for producing high grade steel products is proposed steel plant will have a capacity of up to. The state government already signed a memorandum of understanding (MoU) with NMDC for supplying the required 4.5 million tonne of iron ore every year for the proposed steel plant.

According to the government claim, the plant will provide direct and indirect employment to about 25,000 people. The state government combined 3,148.68 acre of land over two villages for the integrated steel plant, which would now be isolated to the YSR Steel Corporation for Rs 1.65 lakh an acre.

### 42 Jindal Drilling Receives A 130 Crore ONGC Contract

**New Delhi, India:** The Jindal Group company, Jindal Drilling and Industries Ltd scored a 130 crore contract from Oil and Natural Gas Corp (ONGC) making the order book rise to Rs2,630 crore.

In a filing to the In a filling to a Bombay Stock Exchange (BSE) the 3 year firm basis for charter hire of directional drilling equipment and services. The drilling equipment are likely to be operational by middle of January next year, it added. Jindal Group is occupied in offshore oil and gas drilling activities and in the horizontal and directional drilling business activity. The company closed it shares at ₹ 1,099 up 5.64 per cent on the BSE.

### BCPL Bio Energy Fastens Ethanol Production Provisional Stage-I Clearance

New Delhi, India: BCPL Railway Infrastructure Limited stated on Thursday that its planned subsidiary, BCL Bio Energy Private Limited, has received provisional stage-1 approval for the manufacturing of ethanol from grains such as maize and rice for use in gasoline blends. This is the first stage of clearance, according to the Bihar Industrial Investment Promotion Rules 2016 issued by the Bihar government, Department of Industries, and Secretariat of the State Investment Promotion Board. The BCPL disclosed this information in a regulatory filing to the stock exchange on Thursday.

BCL Bio Energy Private Limited would be allowed to seek for additional permits as necessary by the Bihar Industrial Investment Promotion Rules 2016. "We at BCPL Railway Infrastructure Limited are glad to notify our stakeholders that our proposed subsidiary firm 'BCL Bio Energy Private Limited' has started its journey and has been granted the Stage – I clearance by the Government of Bihar, Department of Industries, Secretariat of State Investment Promotion Board," stated BCPL Chairman Aparesh Nandi in response to the news.

Commenting on the development BCPL's

Chairman Aparesh Nandi said, "We at BCPL Railway Infrastructure Limited are pleased to inform our stakeholders that our proposed subsidiary company 'BCL Bio Energy Private Limited' has started its journey and has been granted the Stage – I clearance by the Government of Bihar, Department of Industries, Secretariat of State Investment Promotion Board.

We are hopeful that the other clearances as required under the Bihar Industrial Investment Promotion Rules 2016 will be granted to us by the concerned department very shortly. The project involves the production of Ethanol from grains like maize, rice etc. at Purnia, Bihar or any other suitable place. It would be operational in around 14 months and its commercial production is expected to be reflected in the accounts of FY23 onwards."



Dynamic Platform to Connect with Chemical Industry Ecosystem

Direct Reach to >200,000 Readers across >25 countries

sales@jasubhai.com www.jasubhaimedia.com





#### TESTIMONIALS





"I very much enjoyed reading the digital issue of the March edition of Chemical Engineering World. Both content and quality of the digital publication of CEW were excellent. The printed and digital versions offer specific advantages and I wish that both will be continued. In the current pandemic the digital publication is of great value since it facilitates uninterrupted access to the magazine. Privately I benefit as well from timely and profound information by having subscribed to printed and electronic media."

### Dr Dietmar Hueglin

Director, BASF Innovation Campus Mumbai

SI Group

"Today on world Environment day (5th June) while I am sharing my feedback with Jasubhai Media team, I applaud this initiative of you going paperless for your magazine Chemical Engineering World. We have come a long way in terms of our technological development and its high time we started leveraging it to minimize the harsh impact that has been caused on our environment. Congratulation for your current shift from publishing print editions to digital magazines and setting a great example for rest to follow."

#### **Suresh Kalra**

VP & Managing Director, SI Group-India Pvt. Ltd.



"The CEW has always been a very rich and fresh source of Information for me for quite a few years now. Though a hard copy has its own aura to it, I am confident that as we make this habit shift arising out of the current pandemic scenario you will achieve the same exquisite result in this digital version."



**Dr. Valmik Dhakane** General Manager, R&D Astec Life Sciences Ltd.

\_\_\_\_\_

44







*"I have gone through the Chemical Engineering World (CEW) March edition. My compliments on transforming and keeping the publication going in such challenging times. Digital transformation and its relevance in all facets of chemicals manufacturing, safety, data management, IOT, marketing and its channels of distribution cannot be overemphasised. Good to it was the focus of your edition."* 

#### **Jatin Aggarwal** Director, Bansal Trading Company



"In my view given the circumstances and need to limit contact with anything not very essential it is an excellent idea to switch to Digital magazine. It will help the reader to remain safe and go through the magazine at his own leisure."



**Ashwani Mehra** Director – Sunlac Paints Ltd



"We applaud Jasubhai Media for taking this initiative to create a digital edition of Chemical Engineering World ! Over the years CEW has become a synonym for process industry information, trends and prospects. CEW has been a platform for all type of business association. The digital version matches the high standard set by the print version and would go a long way in enabling the industry at such critical times. We are proud of our association and look forward to contributing in next editions with our thermal processing technology, capability and expertise. Wishing all safe and health working and overcoming the pandemic with stable business."



**V Gokul Das** Chairman and Managing Director HRS Process Systems Ltd.

# Future Trends & Technologies for Municipal & Industrial Wastewater Treatment



he pattern of growing water demand driven by increasing population, urbanization & industrialization is alarming

and leading towards water scarcity. In this scenario, it is critical to start managing the wastewater and the first step towards this would be to call it 'used water' irrespective of whether it is generated from domestic or industrial use. Taking cognizance from this trend, Chemical Engineering World focuses this edition on 'Future Trends & Technologies for Municipal & Industrial Wastewater Treatment'.

Notable industry leaders share their methodologies and implementation of

treating the effluent at the manufacturing facilities and tackling the looming water crisis while abiding by strict environmental norms.

The Cover Story explores further the plant capacity and products at manufactured units and various parameters of quantity and quality of generated effluent. They also share the company's smart initiatives taken to manage water & wastewater management, the latest technologies deployed at the facility, how it helps reducing COD & BOD levels and improve water recovery from the effluent. ■

# Non- compliance: Not an Option in Wastewater Treatment



**Sudhir Shrivastava** (Retd. IAS), Chairman, Maharashtra Pollution Control Board Govt. of Maharashtra



**Sudhir Shrivastava (Retd IAS),** Chairman, MPCB appreciated the stance of National Green Tribunal to come down heavily on polluters, shared insights into the how NGT was working very closely with CPCB to drive the regulators and industries towards compliance.

"Compliance is absolutely to be followed and non-compliance is not an option. The fines that are being levied are very significant. Even if one goes to the Honorable Supreme Court, very little relief is available and even if one pays some of the fine, the polluter cannot stay operational unless it becomes compliant."

# 'Time has come that we stop using the word wastewater but call it used water'



### **Dr Prashant Gargava**

Member Secretary, Central Pollution Control Board Ministry of Environment, Forest and Climate Change Government of India



**Dr. Prashant Gargava,** Member Secretary, CPCB, Ministry of Environment, Forest & Climate Change, expressed the pattern of growing water demand driven by increasing population, urbanization & industrialization is alarming & leading towards water scarcity.

"Water availability in 1951 which was about 5100 per m3 came down to 1820 per m3 in 2021 and projections is it will further drop down to 1000 m3 by 2025 which makes it a scarce resource," he said. In this scenario it is critical to start managing the wastewater and the first step towards this would be to call it 'used water' irrespective of whether it is generated from domestic or industrial use."

# Innovation and Trends: Water Recycling & Pollution Control Solutions



**Dr Y B Sontakke** Joint Director - Water, Maharashtra Pollution Control Board Govt. of Maharashtra

Video Link: https://youtu.be/DLoNFOVLLGk



Dr Y B Sontakke, Joint Director Water, Maharashtra Pollution Control Board, delved into the existing treatments- Biological processes, Physicochemical processes & Hybrid processes that are used for water reuse and added that technology would play a pivotal role.

He also envisages using the STP sludge to produce power to meet the power requirement of STP. Rashtriya Chemicals & Fertilizers (RCF) is recycling 27 MLD of raw sewage which has helped reduce the burden on raw water and the water can be recycled number of times.

# Integrated Water Management & Zero Liquid Discharge for Synthetic Yarn Producer



**Ajay Popat** President Ion Exchange (India) Ltd.

Ion Exchange (India) Limited a leading company in the field of water
 & environment management was chosen by India's largest producers of polyester fibre and synthetic yarn, to build an integrated total water management facility for its largest Polyester Filament Yarn (PFY) unit. This was based on the successful installation and start-up of two previous wastewater treatment facilities for this company.

he major challenge faced by the unit was water scarcity and 'No Consent' to discharge complex effluent so Ion

Exchange recommended 'Integrated Water management with Zero Liquid Discharge System'.

For integrated water management with Zero Liquid Discharge (ZLD), Ion

Exchange has built a raw water treatment plant with advanced clarification and filtration process as pre-treatment to a state-of-the-art, completely skidmounted Indion Swift Demineralization system. To meet the integrated water management projects' requirement of high purity demineralised water, low footprint and completion of the project in minimal time, Indion Swift Demineralizer

May 2021



(L) INDION Zero Liquid Discharge, (R) INDION Swift Demineralizers

which operates on the principal of short cycle-rapid regeneration with simultaneous regeneration of cation and anion unit also helped in producing near-neutral effluent thus minimizing the volume and cost of effluent treatment. The unit which is completely automated consistently produces mixed bed quality water.

The state-of-the-art effluent treatment process comprises of high rate MBBR system (Indion FMR) followed by a high recovery Ultrafiltration and Reverse Osmosis system. The ultimate recovery of >95% for the ZLD Effluent Treatment Plant (ETP) was achieved through Indion Multi-Effect Evaporator system as the terminal unit of the ZLD process. Further, to meet a very challenging project completion schedule, the construction time was reduced significantly by constructing all water holding tanks using glass-reinforced steel bolted tanks.

For utility water management in this integrated project, Ion Exchange supplied the Indion Auto Valveless Gravity Filter (AVGF) that requires minimal power, chemicals, footprint and operator attention while producing consistent water quality required for the cooling water circuits.

With the completion of the integrated water management project for India's largest Synthetic Yarn producer, Ion Exchange has helped them once again achieve its objective of integrated water management and Zero Liquid Discharge.■

# **Upgrading The Effluent Treatment System**



**JK Saboo** Executive Director IG Petrochemicals Ltd

IG Petrochemical enhancing its effluent treatment system to attain
 the discharge of 220 cmd max from 689 cmd through their course of designing, upgrading ,challenges, is shared by JK Saboo, the Executive Director of the company.

stablished in year 1992, IG Petrochemicals is the largest manufactures of Phthalic Anhydride Phthalic Anhydride, Maleic Anhydride7&Benzoic Acid. Recently IGPL has upgraded the effluent treatment system in order to maximize water recycle and minimize the effluent discharge to CETP & achieved the effluent discharge of 220 cmd max from 689 cmd.

### **Highlights Of Upgradation**

Reverse osmosis system

- Multiple effect evaporator & Agitated thin film dryer
- High COD Alkaline streams neutralization & evaporation
- Primary secondary & tertiary treatment was upgraded by replacing trickling filter, aeration tank (using diffused aeration system) & other equipment.

While designing the upgradation, provision has been made for taking care of any further expansion and also to maximize further recycle by addition of some balancing equipment.



**Trickling Filter** 



**RO** Plant

- Utilization of excess low pressure waste.
- The total design capacity of entire ETP is 791 m3/day
- The capital cost incurred is Rs 25 crores.

The COD of incoming effluent is <5000 mg/lit . With the redesign of Trickling filter and aeration tank (using the diffused aeration), the efficiency of COD degradation has increased & outgoing COD has come down from earlier 200mg/ li to 100 mg/lit.

The biggest challenge in upgrading system to recycle the effluent is capital cost, energy cost (Power &steam). Use of waste steam and use of in house power generation made it possible.

As the time passes the industry will have to find out ono option than to conserve water and reduce effluent loads. In a step towards this we have tried to design system for future upgradation.

#### FEATURES

# Mist Evaporation System For Zero Liquid Discharge: An Environment Friendly Solution For Liquid Waste Disposal



**Makarand A. Chitale,** the Director (Technical) of Mist Ressonance Engineering, explains the essence of Mist Evaporation System technology, and how MREPL has executed a system to adopt Zero Liquid Discharge Policy to safeguard nature.

e all know that Industrialization is very much essential for our economy and growth of the society. However, it is also necessary to keep balance

of nature & maintain a pollution-free environment. Hence, A few years ago, Government of India declared Zero Liquid Discharge Policy for process industries. This means that any process industry, which is using water as its auxiliary must consume or reuse the water in its process. Any form of liquid which can pollute our rivers/water source should not be discharged outside the premises.

This mandate forced the process industries to use the conventionally known

Zero Liquid Discharge Technologies, which use large Multiple Effect Evaporators that consume high amount of steam/ coal. Their capital expenditure is also very high & at the same time their OPEX is also enormously high. So it was not possible for the small/medium sized industries to adopt this technology. Many industries still throw the dirty effluent water/ RO reject to open water sources/rivers thus polluting precious water or harm aqueous life.

Hence it was necessary to find a technology which will be affordable to all size of industries and environment friendly.

MREPL is glad to announce that they have developed Mist Evaporation System

(Natural evaporator) for Zero Liquid Discharge of RO Reject / Effluent, which use minimum utilities like steam/coal/ electricity. Effluent/RO reject is naturally evaporated by their unique patented technology of Mist creation with or without help of waste heat available in the plant. This helps the industry to adopt this system at minimal OPEX compared to conventional system & even its first investment is about 50% or less in comparison to MEE.

In the year 2016, MREPL received the prestigious "G. S. PARKHE INDUSTRIAL MERIT AWARD" given by MCCIA for Innovation in Entrepreneurship. The Award was received for our Technology of Mist Creation & its application in Zero Liquid Discharge of RO Reject / Effluent.

Since then the system has been successfully implemented at many process industries.

#### Technology of Mist Evaporation System

Mist Evaporation System is a high efficiency system, which works on our Mist Cooling Technology which induces water to intensive atomization i.e. water particles are subdivided to around 5 microns. The atomized particles shoot out of MIST-CREATOR NOZZLES at immense speed and rise to a height of 6 meters above the

#### nozzles.

This ensures extensively large surface area for a longer interval and at high velocity providing a mist formation. Surface evaporation is very fast, faster than the time needed to reach equilibrium. This ensures faster evaporation of water and the effluent water starts concentrating.

It is very important to note here that, this evaporation is carried out inside a closed chamber in most cases & hence pure water vapor goes away from top through Mist Eliminators thus achieving Zero Liquid Discharge.

Mist creator nozzles operate with a chokeless design as mist formation is achieved when water comes out in whirling motion through its bore of size more than 16 mm in diameter. Hence, MES can easily handle RO/Effluent water of TDS up to 40% concentration without any choking.

#### **Mist Evaporation Effect**

As effluent water passes through Mist Evaporation System at very high velocity due to our patented nozzle design, it atomizes the water particles to fine mist to the size of 5 micron. As these fine mist particle come in contact of large air surface area, they tend to absorb heat available in ambient air and hence evaporate instantaneously to a large FEATURES



Schematic Drawing For Conventional Multiple Effect Evaporator (Mee) System

56



Schematic Drawing For Mist Evaporation System For ZLD

Sr. No.	Description	Conventional MEE System	MES with natural evaporation – without using any heat source	MES with waste heat source viz. Hot air, hot water, flash steam, flue gas etc.	Mist Evaporation System with live steam as heat source throughout the year
1	Capacity (KLPD)	10	10	10	10
2	Salient features a) Water Consumption b) Waste Water Generation c) Civil Work d) Maintenance	a) Make up required for CT b) Impure 50°C condensate generated is to be disposed. c) Heavy due to static and dynamic load d) Very high	<ul> <li>a) No Make up required</li> <li>b) No excess /impure</li> <li>condensate generated.</li> <li>c) Simple due to table top</li> <li>construction with static</li> <li>load.</li> <li>d) Negligible</li> </ul>	<ul> <li>a) No Make up required</li> <li>b) No excess /impure</li> <li>condensate generated.</li> <li>c) Simple due to table</li> <li>top construction with</li> <li>static load.</li> <li>d) Less</li> </ul>	a) No Make up required b) No excess /impure condensate generated. c) Simple due to table top construction with static load. d) Less
3	Operational Cost/KLPD	Rs. 1000/KLPD	Rs. 100/KLPD	Rs. 80/KLPD	Rs. 500/KLPD
4	Saving on OPEX	Nil	Rs. 900/KLPD	Rs. 920/KLPD	Rs. 500/KLPD
5	Initial Cost	High	Low	Low	Low
6	Plot size	3 m²/KLPD	10 m²/KLPD	6 m²/KLPD	6 m²/KLPD

Mes V/S Conventional Multiple Effect Evaporators With Various Options

extent. We have observed this natural evaporation is appx. 18% in a day (Annual Average). This is additional evaporation due to natural mist evaporation effect combined with solar evaporation. This natural evaporation reduces actual heat required in heating tank.

# Mist Evaporation System For Zero Liquid Discharge

Mist Evaporation System combines our unique Mist Cooling Technology with ambient Heat/ Solar plate effect to achieve Zero Discharge of Effluent / RO Reject. This unique system also can use waste heat available at the plant to heat the effluent on one side & evaporation is achieved through Mist Evaporation Tower on second side to achieve Zero Liquid Discharge with minimum use of energy.

#### Salient Features Of MES Over Conventional Systems (MEE/MVCM)

- Minimal OPEX due to Natural Evaporation.
- Lower CAPEX.

FEATURES



- Entire operation happens inside a closed chamber only allowing pure water vapour to escape thus acting as a Natural evaporator.
- Negligible maintenance due to choke less design of nozzles.
- Vacuum and cooling system is not required.
- No make-up water required.
- MES achieves complete zero liquid discharge as the process does not produce impure condensate which is generated by conventional MEE which is to be disposed.
- Easy to operate.

#### Comparative Diagram Of Conventional Mee System & Mist Evaporation System For Zero Liquid Discharge

#### Types Of Mist Evaporation System (Mes)

#### **Open Type MES**

Where area is available, MREPL can guarantee complete Natural evaporation of effluent/RO reject by our high efficiency Mist Creation System installed in Open basin.



#### Totally Enclosed MES For Salt Concentration/ Zero Liquid Discharge

MES is closed from all sides up to 7 meter height by louvers and by canopy/mist eliminators at the top. Entire operation happens inside a closed chamber with top covered with Canopy/ Mist Evaporators. This allows only pure water vapour to escape from top & avoid carryover of any



mist particle or impurities and also arrest entry of rain water.

This Technology Will Now Help Any Size Of Industry To Adopt Zero Liquid Discharge Policy Easily And Preserve Nature. ■



Dynamic Platform to Connect with Chemical Industry Ecosystem

Direct Reach to >200,000 Readers across >25 countries

sales@jasubhai.com www.jasubhaimedia.com







### Author

Makarand A. Chitale Director Mist Ressonance Engg Pvt Ltd 59

# Glass Filter Media with AOP Techniques for Removal of Microplastics from Domestic Wastewater

Nikunj B. Shah, Dr. Kiran D. Patil, Dr. Shilpa P. Kodolikar and Niraj S. Topare from Dr. Vishwanath Karad MIT World Peace University, in this case study talk about the vehement importance of dealing with microplastics, the danger they possess to the environment and effluent treatments of removing them.

60

he built-up of microplastics quantities found in the environment have stressed the urgency to identify, develop and deploy scenarios in which municipal wastewater treatment plants (MWWTPs) limit the release of urban microplastics into the environment. Microplastics have been found almost everywhere on earth, from Antarctic ice sheets to the stomachs of seabirds, to our own faces. Microplastics are particles smaller than 5 mm, consisting of tiny plastic granulates or fibers. Due to the chemical composition of plastics, these particles are resistant to degradation. Their small

size makes them easily accessible to a vast range of organisms and transferable along the food chain.

This results in the accumulation of potentially hazardous effects on both organisms and humans alike, causing alternations in chromosomes leading to obesity, infertility, and cancer. Microplastics mainly originate from sources such as synthetic fibers, automobile tire wear, household dust, and the deterioration of plastic surfaces in the domestic wastewater. Due to the lack of certainty about microplastics and their derivatives functioning in effluents from the secondary treatment plant and transport processes, an ongoing debate exists about the microplastic buildup in the discharged effluents.

Nonetheless, MWWTPs are found to be significant sources of microplastic leakage into the environment. Due to the sheer volume of continuous discharge into the aquatic environment, the final effluent acts as an exit route for microplastics. With increasing stress on the availability of fresh water and changes in statutory policy by various central and state governments, the subject of water treatment, utilization and reuse have gained significant importance. Due to the classification of water in various categories (e.g. freshwater, industrial effluent, domestic effluent, greywater), various parameters are ascertained, and they are fixed on the basis of the source of the water and physio-chemical water constituents. The values of the parameter as per the chemical and biological analysis report of the water are tested and the method of treatment is finalized in most of the studies. In the current stage of the treatment – all the domestic effluent treatment plants are designed till secondary treatment which ends with are biological process. There is no tertiary treatment in place in more than 99% of the treatment plants in India only do the treatment till the secondary stage. The effluent stream is mostly released in open water bodies like canals, rivers or any other area. The domestic standards for effluent treatment as per CPCB and NGT

guidelines are the reference points for permitting the water discharge in the open water body.

#### Advanced Oxidation Processes (AOPs)

Over the last few decades, advanced oxidation processes (AOPs) have received a lot of attention in wastewater treatment research and development. It is known as oxidation technologies that use the hydroxyl radical (•OH), examples include cavitation, photocatalytic oxidation, Fenton's chemistry, and ozonation. These processes have successfully been used to remove or degrade toxic pollutants or used to pretreated insoluble pollutants that can be treated by biological methods. It is widely accepted that an efficacious practices are largely depends on generating reactive free radicals, of which the most important one is the hydroxyl radical (•OH).

# Design and Development of System

The system consists of an inlet tank for raw water or influent storage. The system is designed with due consideration of the fact that the effluent of the secondary effluent plant is the influent for the system. This influent is fed to the disc filter unit using a feeding pump. The removal of suspended solids, impurities will be taking place in the disc filter. An online static



Figure 1: Process Flow Diagram for Water Treatment Filtration Plant (Capacity: 1m3/hr)

mixture is considered to break the homogenized suspension or a colloidal suspension and induce charge and increase ORP by grounding the static mixture helping in physical separation. It will also be used as an Injection point for the chemical, for generating hydroxyl radical. Hence chemical dose will be uniformly mixed inside the static mixer.

This is followed by a UV chamber with an intensity of 200 mj/cm2. This UV intensity is capable of generating the OH- radicals intended for the chemical destruction of the plastic byproducts as per the literature and previous work. The OH- radical COD

BOD and will come out in suspension from the dissolved form further removed by filtration. This will also aid up the microbial reduction of the colony-forming units which is another concern while microplastics removal. Subsequent to the UV chamber dual glass filter vessel setup is considered for the filtration of the UV-treated effluent stream. The selected vessels are 18-inch x 65- inch in size. The vessel filtration velocity is considered at 10 m3/m2/hr. The glass media selected is different in the two vessels. One vessel contains a hydrophilic medium, and in the second vessel it is a hydrophobic medium. Accordingly,

will be destructed into biodegradable



Figure 2: Glass media filtration and AOP technique based tertiary effluent plant for micro-plastics removal (Actual site image)

with the different types of impurities in water, both media on standalone or in series or in parallel will give the removal of microplastics based priority VOCs and SVOCs. Figure 1 shows the process flow diagram of the water treatment filtration plant (Capacity: 1m3/hr) and Figure 2 shows the images of the actual setup.

#### **Highlights of the Work**

The setup designed will have significant applications in testing the use of AOP accompanied glass media-based filtration for the removal of most emerging water pollutants; microplastics and their priority derivatives SVOCs and VOCs.

As most of the domestic effluent treatments do not consider the tertiary treatment of the wastewater, the proposed setup may provide a breakout technique and henceforth reduce the amount of microplastics and their derivatives disposed directly into the nearby water bodies.

The removal mechanism envisaged by filtration and oxidative destruction, as the incoming effluent is an outlet of biological process, so biodegradable BOD and COD both have been removed in the second step. The incoming water has a nonbiodegradable impurity. The studies are intended for the removal of microplastic, MP derivatives, and other priority substances like SVOC, etc. which come in water, due to plastic.

For a conventional sand media, the micro-organisms, attach to the surface of the sand media and secrets polysaccharide glue, forming mudball formation, resulting in channeling during filtration. Hence sand is not a recommended media for STP effluents. Also, the Hydroxyl radical will have a negative impact on the bicarbonate structure of the sand, hence not compatible.

The use of glass media for filtration represents a smart choice. Glass is the most inert and having maximum strength, glass being the most chemically inert, and very high abrasion resistance.

The green-colored glass chosen is carrying chromium ions. The chromium will impart natural zeta potential to glass and also in presence of higher oxygen - chromium acts as a catalyst to generate hydroxyl molecule and aiding in oxidative destruction.

By considering this technology and parameters, efficient technology and system can be designed and implemented for the removal of microplastics from the domestic effluent. ■

## **Authors**

Nikunj B. Shah Research Scholar, School of Chemical Engineering Dr. Vishwanath Karad MIT World Peace University SVS Aqua Technologies, Pune





Dr. Shilpa P. Kodolikar Assistant Professor School of Chemical Engineering Dr. Vishwanath Karad MIT World Peace University, Pune



Niraj S. Topare

Assistant Professor School of Chemical Engineering Dr. Vishwanath Karad MIT World Peace University, Pune.



# **Quantum Leap your Business**

via

# Dynamic

# 'Pharma Bionetwork' platform

Directly Reach the Inboxes of **40,000**+Affluent Leaders & Business Influencers' from the **Pharma Industry** each month with the PharmaBio World Digital Edition

sales@jasubhai.com

www.jasubhaimedia.com





# Case Study: 45 MLD Koyambedu Tertiary Treatment Reverse Osmosis Plant, Chennai



66

oyambedu Tertiary Treatment Reverse Osmosis plant has won the prestigious Global Water Awards 2020 – Distinction Award under the

category "Wastewater Project of the year". This award is selected from nominations received from various wastewater projects across the globe, commissioned during the year 2019 and awarded for those that shows the greatest innovation in terms of optimizing its physical or environmental footprint. Koyambedu Tertiary Treatment Reverse Osmosis plant supplies 45 million litres of water to 691 industries in the outskirts of Chennai, thereby releasing approximately 16 billion litres of clean water annually for drinking purposes.

This is the largest and the most technologically advanced reuse plant in India built by consortium of VA Tech WABAG (80%) and IDE Technologies (20%) for Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB).

It is the first reuse facility in India to use Ozonation for disinfection and marks a decisive step for the country's ambitions for municipal water recycling. Furthermore, with the completion of the TTRO, Chennai is now the first Indian city to reuse more than 20% of its treated wastewater.

#### Background

Drinking water is becoming increasingly scarce with ever increasing population and rapid urbanization. All over the world, there is an urgent need to look beyond dwindling traditional sources of water supply and to encourage sustainable as well as dependable sources of water to meet their demands. Reuse of treated municipal wastewater is one such option which has been established as economically viable and obviously less expensive compared to other options.



Koyambedu TTRO Plant

India alone has witnessed tertiary treatment projects coming up in the major metropolises, which are water stressed. Chennai, a metropolitan in the southern part of India and capital of Tamilnadu, is one such city which has seen rapid urbanization in the past two decades and is completely water stressed with ongoing struggles of drought and water scarcity.

#### **Solution with Reuse**

CMWSSB is the nodal agency for supply of water for domestic and industrial purposes and also for management of municipal sewage. Chennai has been a pioneer in reusing treated wastewater, wherein industries like Chennai Petroleum Corporation and Madras Fertilizers are buying treated municipal wastewater from CMWSSB for over a decade to meet their water demands.

To continue its efforts in meeting the water demands of the city, as the next step, CMWSSB plans to directly reuse municipal treated wastewater for industrial applications through tertiary treatment thereby reducing the fresh water consumption by the industries operating in the vicinity of Chennai.

Chennai is the first city in South India to reuse treated wastewater for industrial applications and ensures reuse of over 20% of the city's treated wastewater. This is a significant initiative in saving and prioritizing fresh water for domestic and

**FEATURES** 

agricultural consumption. The Koyambedu TTRO Project for example helps save over 16 billion litres of freshwater annually. The project will boost Chennai's water resilience and sustainability.

## The Project

68

Chennai is covered with 98% sewer network. There are 12 sewage treatment plants at 4 locations covering 5 zones of sewerage systems. Koyambedu Tertiary Treatment Plant project area falls under Zone III, treating the sewage generated in the Central & Western Chennai and adjacent to urbanized areas of Ambattur and Mogappair.

To ensure a sustainable and dependable source of water for industrial purposes, the Hon'ble Chief Minister of Tamilnadu made an announcement in the State Assembly that Tamil Nadu has a vision to ensure 100% reuse of treated wastewater.

CMWSSB is progressing in a phased manner towards the goals stated in Tamil Nadu's Vision 2023 Policy. Accordingly, CMWSSB proposed to set up the Koyambedu Tertiary Treatment Reverse Osmosis (TTRO) plant and awarded the contract to VA Tech WABAG - IDE Technologies consortium on Design, Build and Operate (DBO) basis for 15 years which also includes supply, laying and maintenance of transmission main and intermediate pumping stations for conveying product water to various industries situated at Irungattukottai, Sriperumbudur and Oragadam industrial areas in South Chennai. In these industrial areas, tertiary treated wastewater will be supplied to 691 industries which comprises industry majors such as: Hyundai Motors, Nissan, Samsung India, Apollo Tyres and Nokia India (Picture 1).



Figure 1: Koyambedu TTRO Plant Project Scheme & Beneficiaries

The project was funded by the Government of India (GOI) under the AMRUT (Atal Mission for Rejuvenation and Urban Transformation) program and the Government of Tamil Nadu under the Tamil Nadu Investment Promotion Program (TNIPP), demonstrating the local authorities' commitment to make Chennai water resilient. After completion, the plant was inaugurated by the Hon'ble Chief Minister of Tamilnadu Thiru Edappadi K. Palaniswami on 29th November 2019.

#### **Sustainable Solution**

Correct design and selection of the right technology represent one of the key success factors in technological sustainability of wastewater recycle and reuse plants. WABAG has vast experience of successful implementation of recycle and reuse plants for more than a decade in India. With its expertise and also considering the requirement of long term operation and maintenance period of 15 years, to improve availability, robustness, reliability and resilience an advanced multi barrier system is employed for Koyambedu TTRO plant (Picture 2). The TTRO uses a multi-stage treatment scheme, including ultrafiltration, reverse osmosis, rapid gravity sand filters, and Ozonation. The UF and RO membranes achieve a recovery rate of 75%, and the plant has an ultra-low specific power requirement of 1.88kWh/m3, which is expected to achieve significant savings in the plant's operating costs over the next 15 years.

# The process comprises the following technologies

Pre-disinfection and Pre-oxidation using Chlorine dioxide dosing

Dual media rapid gravity filtration for removal of suspended particles in the wastewater (Picture 3). These filters employ a unique excess head backwashing technique, A basket strainer (50 mm) system for removal of fine particles, Further polishing of



Figure 2: Koyambedu TTRO Plant Scheme

wastewater to remove fine suspended and colloidal particles using ultrafiltration (0.01 mm) system, aa cartridge filtration (5 mm) system which comprises variety of micro-porous filters to remove fine particles, a three stage reverse osmosis system with an overall recovery of FEATURES





80% removes the dissolved salts present in wastewater and ensures TDS quality of less than 70 mg/l in the tertiary treated water, a degasser tower is provided for reduction of carbonic acid, to prevent the microbiological growth in the treated water pipeline, Ozone is dosed as disinfectant at site and intermediate storage locations, quality of the tertiary treated water being supplied for industrial purposes from the Koyambedu TTRO provided is furnished in Table 1. The Beginning & the Future

Water recycle & reuse is projected to be the key growth driver, opening up the major business opportunities in the days to come. Several States in India have come up with reuse policies aiming at recycling 70% treated wastewater by 2025 and 100%

treated wastewater reuse by 2030, further providing the required impetus for the sector in India.

The global recognition by way of Global Water Award 2020 to the Koyambedu TTRO project further reinforces WABAG's position as a proven global leader in recycling & reuse, a segment projected to have the highest growth potential over the next 3 years. Given its global references and proven technological expertise,

> WABAG is well poised to capitalize on this potential observed in the water reuse segment.

The project marks a decisive step in the direction of municipal water recycling, thereby promoting an

SI.	Description	Unit	Value
No.			
1	Total Dissolved Solids (TDS)	mg/L	< 70
2	BOD	mg/L	BDL
3	COD	mg/L	BDL
4	Total Silica (as SiO2)	mg/L	< 5
5	рН	-	6.5 – 7.5

Table 1: Quality of Tertiary Treated Water from the Plant

70



**Reverse Osmosis** 

alternative and viable model for urban water governance. Apart from saving 45 million litres of fresh water daily, CMWSSB is also expected to earn a revenue of



Ultrafiltration

₹5.4 million daily, through sale of tertiary treated water to industries.

It can be concluded that the Tertiary Treatment of Municipal wastewater is going to be an important driver for the water treatment industry and is crucial in bringing water security to the most



### Author

## Senthilkumar Chandrasekaran

Head - Process & Proposal VA Tech WABAG Limited



Ozonation units

water stressed cities across the world. The segment is expected to witness exponential growth driven by Government policies on municipal industrial partnerships, Jal Jeevan Abhiyan and Smart Cities Mission. ■

71

# Natural Waste Water Treatment To Combat Climate Change

**Prof. Rajendrakumar V Saraf,** the Chairman of Viraj Envirozing, India, shares some insights on how urban areas can tackle its sewage generation, collection, treatment and disposal methods systematically. From various biological treatment to types of Phytoremediation, such important treatment methods for urban agglomeration is shared.



ore than half of the entire humanity live in cities around the globe. By 2030, 6 out of 10 people will be urban dwellers.

In India, 31% of the total population live in urban areas & 17% of the urban population lives in slums. By 2030 India will have 7 megacities with a population of over 10 million. India is home to about 1.21 billion people, representing about 17% of the earth's population is going through the fastest transformation of rural to urban India. Urban India continues to grow in a haphazard fashion without the availability of basic amenities like water supply & sewerage system.

With the development and population growth, Gram Panchayat gets to transform into an urban agglomeration named Nagar Panchayat then a Municipal Council & finally Municipal Corporation. Besides, urban areas are spreading by the inclusion of nearby villages. The growth of urban agglomeration is converting agricultural land into non-agriculture purposes. Growth has also encroached on natural water bodies and forest land. Pune, Mumbai, Bangalore are the best examples. Change in land use pattern cease natural sequestration of Carbon dioxide and production of Carbon dioxide begins due to domestic, commercial & Industrial activities.

#### **Carbon Sequestration**

Carbon sequestration is a process through which carbon from the atmosphere is absorbed by trees, plants, and crops with the help of photosynthetic reactions. This carbon can be extracted as stored


Figure 1 – Types of Biological Treatment

energy from plants in form of biomass. It includes crops and their residues, plant parts, animal wastes. Sequestration of Carbon dioxide is most essential & useful to reduce the increasing level of carbon in the atmosphere. This is an ongoing process on land, wetland & water bodies.

### Present Status of Sewage Generation, Collection, Treatment & Disposal

Treatment of industrial wastewater is compulsory by law. However untreated sewage is discharged into receiving water bodies. Collection, treatment & disposal of sewage are very serious problems faced in newly expanded urban areas. If sewerage system is not provided residential complexes collect the wastewater and partially treat in the septic tank under anaerobic condition. The overflow from the septic tank either goes to the soak pit or joins the nearby mullah. Drawbacks of this system are Partial Treatment, Causes of smell; Sludge gets accumulated & requires removal once in 2 to 3 years & Causes water-logging in the soak pit if the percolation rate of the soil is poor.

#### FEATURES



Figure - 2 Treatment Units in Sewage Treatment Plant

Where sewerage system is laid down, sewage is collected & directly disposed of into receiving water bodies or treated by conventional treatment methods.

A commonly used Process for Sewage Treatment is the Activated sludge process & its modifications. The aerated lagoon is not common for Sewage Treatment. Treatment processes based on attached growth are Trickling Filter & Rotating Biological Contactor. Trickling Filter use is not very common. Rotating Biological Filter is used for Small Flow. The modifications are Moving Bed Bioreactor, Membrane Bioreactor, and Sequential Bioreactor, etc.

Conventional treatment system requires capital cost, energy to operate the system, skill manpower & maintenance cost for mechanical equipment. This ultimately results in the direct and indirect generation of Carbon dioxide. It also has a bigger Carbon Foot print as it requires energy to run & generates Carbon Dioxide & Methane as a product of biodegradation that adds to Green house gases.



Figure – 3 Reactions in Oxidation Pond

India is blessed with Ample of Solar Energy. Solar energy through photo synthesis generates oxygen and fixes carbon dioxide in form of biomass. However, the inherited natural technology like Stabilization ponds and Wetland Treatment has almost forgotten with the pretext that it requires a large area and may generate the off smell.

### **Oxidation Pond**

Ample sunlight couple with the availability of nutrients in sewage promotes the rich

growth of algae. Algae supply oxygen to microorganisms for the growth and biodegradation of organic matter. Physical, chemical & biological reactions in the Oxidation pond are given in Figure – 3

The oxidation Treatment pond does not require electricity. If it is properly operated it does not generate smell. It also fixes carbon dioxide in the form of algae as Biomass. Fundamental factors for design are Sunlight & sunny days, Lagoon depth, Composition of wastes, Amount of wastes, Temperature, pH within 6-8, Pretreatment





& Bacterial species. Organic loading as Kg/hectare & detention time is the main design parameters to find out the size required for the Oxidation Pond. A typical loading value in India is given in Figure 4

Detention time is 2 to 10 days. Depth of Tank is 1.2 to 1.8 M. Algae measure as chlorophyll – 500 to 1500 microgram/l. Typical design of Oxidation pond for a population of 25000 – It will generate 2500





m3 /d sewage @ 100 lpcd. BOD of sewage is 150 mg/l. The total BOD load will be 375 kg/d. Select Organic loading rate 225 kg/ Ha/d. The total area required is 1.67 Ha. Depth is 1.5 M. Total; the volume of tank is 25000 m3. Retention time is 10 days.

The sequence of Oxidation pond – Maturation pond – Fish Pond will generate revenue by harvesting Algae & Aquatic animals like fish. Oxidation pond is the most appropriate Technology for the urban agglomeration like Nagar Panchayat and Municipal Council.

Diffuse pollution in rivers is extremely difficult to control & often results in serious degradation of water quality. Polluted river water can be treated by the development of large impounded lakes to remove & degrade the residual pollution. Such lakes are similar to maturation ponds. The use of an Oxidation Pond for River Purifications is as shown in Figure 5.

## Phytoremediation

Phytoremediation is a bioremediation process that uses various types of plants to remove, transfer, stabilize, and destroy contaminants in the soil and water.



Figure -6 Different Types of Phytoremediation

Common Application of Phytoremediation is by using Floating aquatic plants in water bodies, Wetland and the use of shrubs and trees in the soil. Wetlands treatment can be described as the biological and microbiological treatment of wastewater resulting from the use of pollutants as food for living organisms in natural or artificial wetlands. The Ramsar Convention has adopted a very inclusive definition of a wetland.

#### Indian Experience for use of Wetland

Use of wetland for waste water treatment plant is known to central & southern part of India for a long time. Waste water from the Bathroom and kitchen goes to a place where Colocasia esculenta (Hindi - Aravi, Marathi - Alu) is grown. It has a lot of advantages like it uses plants, microbes, sunlight and gravity, Microorganisms growing on the roots of Plant help in FEATURES

degrading the organic matter in the wastewater, Eliminates off smell, waterlogging of water & growth of mosquitoes, Leaves & & corns (roots) are used to make dishes in the kitchen, Chemicals, energy and maintenance are not required, Highly effective & eco-friendly and Adds green cover. Wet Land treatment is also known as Phytoremediation or Root Zone Cleaning System.

#### Working of WetLand Treatment

It consists of biological, chemical, and physical reactions. It includes physical filtration and sedimentation, biological uptake, the transformation of nutrients by bacteria (anaerobic and aerobic), plant roots and metabolism, as well as chemical processes (precipitation, absorption, and decomposition).

### Development of Constructed Wetlands for Sewage Treatment

A constructed wetlands can be classified as constructed habitat wetlands, constructed flood control wetlands, constructed aquaculture wetlands, and constructed wastewater treatment wetlands. Constructed wetlands are more efficient than natural wetlands because they are designed for optimum performance of the particular function.

#### Natural Energy Waste Water Treatment

Since 1998 Author carried out extensive research on Waste water Treatment by Constructed Wet Land. 35 wetland plants were scanned for their performance. Experiments were carried out with Laboratory scale and Bench scale model. Design parameters for a very efficient system with modified media, flow pattern, uniform distribution, water depth, water holding capacity, Hydraulic and Organic loading rate & retention time are



NEWT for Reuse of Treated Sewage for WC Flush

Figure – 7 Application of NEWT



Figure – 8 Treatment of Polluted River water by Natural Treatment

developed. The Technology developed is named Natural Energy Waste Water Treatment (NEWT) (Patent No. 350396). The findings of the working plant are presented in National & International conferences.

#### Performance of NEWT at Field

The treated sewage has BOD less than 5 mg / I and Turbidity less than 10 NTU. The process does not generate any off smell & treated sewage does not have any off smell. It doesn't require any chemical or energy input & skilled & unskilled manpower. It is sturdy and resistant to flow variation and shock loading. However, the removal of dead culms is advisable. Treated sewage can be directly used for WC flush & irrigation of the green areas. It can handle a minimum of 10 to 1 million litres of Sewage per day. Some of the Applications for treatment & reuse are given in Figure 7.

NEWT is incorporated in Three-Tier System Developed & Implemented by

FEATURES



#### Quaternary Treatment:-Microfiltration -> Ultra - filtration -> Ozonization It can be used for cloth washing. It further saves around 15-20% of fresh water.

Figure - 9 Application of NEWT in Three Tier System

Author for Residential complex with Population up to 2000 is shown in Figure 9. It eliminates the use of Drinking water for Flushing Toilet and saves 40% of fresh water.

Urban Floods caused due to Change in Land use & Rain Fall Pattern. NEWT will be the best option for Stormwater Collection Treatment & Disposal. It will remove a wide range of storm water pollutants from land development sites, provide wildlife habitat, add to aesthetic features & reduce peak runoff rates.

Water and Food Security can be achieved for small municipal councils of up to 50000 populations. Sewage generated will be collected in Treated in Oxidation Pond or NEWT. Fully treated be sewage will be store and distributed to the Farmers downstream.

# Carbon Dioxide Generation & Sequestration

In the aerobic process production of

_	-		_		
F	F,	Δ		IR	FS

Process	Green House Gas produced	Sequestration of CO2
Activated sludge Process	The basic reactions involve the breakdown of the organic matter (represented by 5 day Biochemical Oxygen Demand and the formation of cell mass (activated sludge) and by-products carbon dioxide and water.	Carbon Dioxide is release to Environment
	Equivalent Carbon Dioxide is also generated due Electricity require to run the system	
Oxidation Pond	As Shown in Figure 3 Carbon Dioxide is utilized by algae to produce Oxygen and New cells. Very little CO2 & methane may get release to environment	Large amount of Carbon Dioxide is sequestered
NEWT	Spectrum of reaction occurs and carbon and nutrients are converted to Biomass. Very little CO2 & methane may get release to environment	Large amount of Carbon Dioxide is sequestered

Table – 4 Green House Gas Produced & Sequestration of Carbon Dioxide

Carbon Dioxide is attributed to two main factors: biological treatment process and electricity consumption. In the mainstream of the WWTP, the organic carbon of wastewater is either incorporated into biomass or oxidized to CO2. In the sludge line, it is converted mainly to CO2 and CH4 during anaerobic digestion and, finally, methane is oxidized to CO2 during biogas combustion.

### Carbon Dioxide Generation & Sequestration by Activated Sludge Process & NEWT

A residential complex having two hundred tenements and 1250 residents is considered for the Case Study. Total water demand @ 135 lpcd is 168750 l/d. Water demand for WC flushes @ 45 lpcd is 56250 l/d. For drinking, cooking, washing and bathing is 112500 l/d. Black water (Sewage) from WC flush (95%) is 53438 l/d & Grey Water (Sullage) from other activities (85%) is 101250 l/d. Total waste water generated will be 154688 l/day. Assuming BOD 250 mg/l. The total BOD load is 38.7 kg/d.

Treatment by NEWT - Blackwater is separately collected & treated in an Anaerobic bioreactor and then along with Grey water in NEWT. The total area required will be 386.7 m2 which will fix carbon dioxide through the wetland plants.

Activated Sludge Process (ASP) - Total Oxygen demand will be 77.4 kg/d (3.2kg/ FEATURES

Details	NEWT	ASP
Aerator, 3 HP, Run hour 24 hr./day, KWh /year	0	19710
Recirculation Pump, 1 HP 12 hr./day, KWh/year	0	6570
Total KWh per year (Approx.)	0	26280
Total CO2 equivalent, T/year @0.93kg/ KWh (6)	0	24.4
Area required for NEWT, m2	386.7	NA
CO2 Sequestration, T year @ 1.68 kg/m2/year	0.65	0

Table – 5 Generation & Sequestration of Carbon Dioxide in NEWT & Activated Sludge Process

hr). Assuming the oxygen Transfer Efficiency of the Surface aerator is 1.1 kg oxygen / Hphr, the Aerator required will be of 3 HP. It will also require a Re-circulation pump of 1 HP. Both will run for 24 hr/day

Natural Energy Waste Water Treatment sequestrates and Activated sludge process generates Carbon dioxide. Besides Activated Sludge Process generates sludge that needs further treatment like anaerobic digestion or composting. This will further add methane and Carbon dioxide. Treated sewage from NEWT can be used directly for WC flush. Tertiary Treatment Plant to reuse sewage is required for further treatment of effluent from Activated Sludge Process. This needs additional energy to run.

Sewage is the evident output of Urbanization. In peri-urban areas & urban agglomeration, collection treatment & disposal of sewage is a severe problem. Urban agglomeration can be planned with an allocated space for Natural Treatment like oxidation pond & Natural Energy Waste Water Treatment (NEWT). Natural Treatment Processes has very low operation & maintenance cost does not require manpower. It does not require Electricity so the equivalent amount of carbon dioxide generated for electricity consumed for conventional sewage treatment plants is eliminated.

At present, the trend is to opt for Energy-intensive technologies for Sewage Treatment. Energy & Carbon footprint is not taken into consideration in the selection process. Besides the technologies (Conventional and modified Activated Sludge Process) generates carbon dioxide as a product of biodegradation. For a Population of 1250 Total carbon dioxide Equivalent to Electricity consumption is 24.4 MT /year. In the Case of Natural Energy Waste Water Treatment sequestration of Carbon Dioxide is 0.65 MT per year. It is recommended to consider carbon dioxide generation & sequestration for evaluation of the treatment process.

#### Reference

- 1. Ramsar Website www.ramsar.org
- Sundaravadivel, M., Vigneswaran, S., 2001. Constructed wetland for wastewater treatment. Critical Reviews in Environmental Science and Technology, 31, 351 - 409.
- 3. Nutrient removal from wastewater by wetland systems, Ishadeep Khanijo, home.eng.iastate. edu/~tge/ce421-521/ishadeep
- 4. R. V. Saraf, Treatment of Polluted River water by RZCS,Technical Publication 42nd Annual Convention 2010, Raipur
- 5. R. V. Saraf, Experience in Treatment of Waste Water by Root Zone Technology, Technical Publication 40th Annual Convention 2010, Indore
- 6. How much carbon dioxide is produced per kilowatthour when generating electricity with fossil fuels? Web site US Energy Information Administration



Dynamic Platform to Connect with Chemical Industry Ecosystem

Direct Reach to >200,000 Readers across >25 countries

sales@jasubhai.com www.jasubhaimedia.com







## **Author**

**Prof. Rajendrakumar V Saraf** Chairman, Viraj Envirozing India Pvt. Ltd, Pune

## Concrete Protective Liner Protects Tank In India





AGRU ECTFE Sure-Grip Liner. The Plas

84

Grip Liner. The Plastics Experts from AGRU offer everything from a single source.

In the course of new development of the refinery Jamnagar (India) belonging to the Reliance petro chemistry group the design engineers of Bechtel were looking for an applicable lining material for the area of the sulphuric acid neutralization tank fulfilling highest requirements concerning durability at temperatures up to 120 °C as well as chemical resistance to highly concentrated sulphuric acid.

A few years ago, the Dutch plasticfabricator Versteden, with high skilled welders and experience in processing fluoropolymers, has executed a similar project with AGRU ECTFE Sure-Grip at Exxon in Antwerp. AGRU Sure-Grip concrete protective liners were specified due to the positive experience at this neutralization tank, which was about 100 m<sup>2</sup>, and therefore significantly smaller than the Reliance project. To ensure the best possible welding quality and to safe costs and time the fabricator did pre-assemblies of the wall, the floor and the ceilingelements in their own workshop. These pre-manufactured units were shipped in boxes directly to the site. The ECTFE Sure-Grip wall elements were fixed onto the formwork, welded among each other and then casted. The three sheeting units of the ceiling were finalized with PP pipe penetrations on the especially prepared mounting area. For the tight transition of ECTFE lined walls and PP ceilings a specially designed and qualified flange sealing system was installed. After the casting of the ceiling and the curing of the floor sheets the grout injection method, with a special non-shrinking cement-grout suitable for these operating conditions.



The construction site in India.



AGRU PP Sure-Grip Liner.

Concrete protective liners are used wherever a concrete building faces tougher requirements. Effective protection for concrete is ensured by the combination of the benefits of special thermoplastic liners (flexible, ductile, no corrosion) with those of concrete (high strength, high stiffness). The concrete is effectively protected thus prolonging the building's service life. Concrete protective liners are thus usable in numerous concrete building applications. Absolute mechanical anchoring and bridging of cracks in concrete, as well as excellent shear and



Concrete successfully protected by AGRU Sure-Grip.

impact strength and the durability of the liners for concrete protection are just a few of the many benefits.

ECTFE possesses a unique combination of properties that are the result of its chemical structure, which consists of a copolymer with ethylene and chlorotrifluoroethylene arranged alternately. ECTFE demonstrates excellent resistance to the corrosive influence of heat, strong radiation, and weathering. The material has high impact resistance and shows almost no property changes in a wide temperature range, making it particularly well suited for demanding industrial applications. Furthermore, ECTFE is known for its good permeation barrier for many chemicals. Its excellent welding properties and thermoplastic formability also make simple and costsaving processing possible, both in the workshop and on-site. Compared to PVDF, ECTFE has a better chemical resistance, especially when exposed to lyes.

## **HTTP & Ultra Silent: Huliot Pipes in Focus**



UltraSilent

HTTP

Huliot Pipes and Fittings Pvt. Ltd. (Huliot India) is India's First Certified Green Pipe Manufacturer of Acoustic Drainage Piping System in Polypropylene, 100 % recyclable and carrying the Green Label licenses by Israeli Standards Institute.

Huliot India is a subsidiary of Huliot ACS which is leading Israeli manufacturers of Advance Flow System in Water Supply, Drainage, Sewage and Grey Water Recycling. Huliot started its operations in Israel in 1947, grown globally since then as a group with its manufacturing base at Portugal in Europe, Central Slovenia and Gujarat in India. We have an ISO Certified factory in Vadodara, Gujarat and we follow EN Standards

### **Product Portfolio**

 Drainage Push fit Pipe and Fittings - "Ultra Silent (Low Noise Acoustic) and HTPro (PP)

- Pex Multilayer Pipe and Fitting for Portable drinking water with crimping technology.
- "Stainless Steel 316L pipe and fittings" for RO and Portable Drinking water supply with Crimping technology.
- Smart Sewage Treatment and Recycling System - ClearBlack for water reuse applications.
- Fire Fighting pipe and fittings with -PPR Red Fire
- Nahni Traps and shower slot Channel



**IBP-Conex** 

87

for Drainage System solution at Bathroom.

#### **Huliot India Products**

Are safe for human and environment usage, does not have any negative impact on health and Nature (less carbon footprints).

Are in great demand with majority of Green Building Construction and endorsed by Leading Architects, MEP Consultants, Builders & Developers and PMC.

environment y negative ture (less

in CIDCO projects. ■

### For more information

**IMPACT FEATURE** 

Shailesh Khamar Vice President: Sales & Marketing Email: shaileshk@huliot.in

Heliroma Red Fire

Are certified by BMC (MCGM) and used

## Future Trends And The Use Of Lipids In Cosmeceuticals



**Janhavi Dandekar** Technical Sales, Personal care division VAV Lifesciences

88

Janhavi Dandekar, the Technical Sales, Personal care division, VAV Lifesciences sheds light on the nanotechnology-based cosmeceuticals industry and the extensive benefits of lipids. She explains how Phospholipids, Liposomes, have made breakthrough achievement shaping the market.

unctional phospholipids are paving the way for nanotechnology-based cosmeceuticals. The quest for natural, effective ingredients for cosmetic formulations has over the years led the cosmetic industry to some path-breaking and transformational technologies. One of these breakthroughs is in the field of nanotechnology for enhancing

the effectiveness of cosmeceuticals. At the heart of this technology lies two interesting ingredients, lecithins, and phospholipids.

Lecithins and phospholipids in their functional form are unique ingredients, due to their characteristics and properties. Versatile and characterized by total safety and skin compatibility, they can be used in all cosmetic formulations, especially for the treatment of specific skin alteration.

### Lecithins And Phospholipids As Ingredients Are Technical Yet Adaptable

Usually, lecithins and phospholipids are considered technical ingredients, complex to use. However, with an accurate evaluation of the formulation to be developed and choosing the most suitable product for the application target, it is possible to use them easily and appreciate their properties, both as emulsifiers, stabilizers, and carriers. They also have an excellent sensory impact on the texture of the formulations. Furthermore, they also act as real functional active ingredients, both for the skin and for the hair, with effectiveness documented by a rich bibliography.

### The Dawn Of The Age Of Nano Cosmeceuticals

Advancements in nanotechnology have opened a wide array of applications in the cosmeceutical industry. Research undertaken over the past three decades has led to the development of advanced lipid-based nano-sized delivery systems such as liposomes, nanostructured lipid carriers, solid lipid nanoparticles, transferosomes, niosomes, and ethosomes. These are known to enhance the skin permeation of various active molecules. The amphiphilic nature of phospholipids, that is, the ability to interact simultaneously with aqueous and fatty phases helps to lower the surface tension and stabilize the two phases. This makes them excellent emulsifiers, co-emulsifiers, solubilizers, and stabilizers, perfectly tolerated and safe for skin and hair. They can be used to formulate stable emulsions for both water-in-oil and oil-



Figure 1: Characteristic structure of phospholipids

in-water emulsions suitable for skincare and haircare with formulations ranging from creams, serums, and lotions, up to conditioners, shampoos, and cleansing products. The use of these emulsifiers also importantly characterizes the texture and skin-feeling, giving a rich and creamy touch, rapid absorption, and a silky sensation on the skin.

### Use Of Phospholipids In Nanotechnology-Based Cosmeceuticals

Highly purified phospholipids today are playing an important role in nanotechnology-based cosmeceuticals, offering several advantages in hair and skincare. Some of these include:

# Developing self-assembly carrier systems (Liposomes)

Liposomes which are composed of one or more phospholipid bilayers can

encapsulate hydrophilic or lipophilic drugs making these vesicles useful drug delivery systems. These carrier systems can convey and protect the active ingredients in the formula and improve the bioavailability of the assets themselves. Due to the affinity of the lipids that compose them, they can blend with the skin barrier, optimizing skin penetration and the effectiveness of the active ingredients themselves.

#### Aiding skin repair

The fatty acid content of phospholipids is remarkably like that of the lipids of the skin barrier. For this reason, they are also called "second skin" and are functional active ingredients. They can strengthen and repair the lipid matrix of the skin, supporting and restoring its barrier functions and regulating trans-epidermal hydration levels. This property of phospholipids makes them particularly suitable for use in moisturizing,



restructuring, and anti-aging formulations, but above all for the treatment of skin alterations and pathologies such as dryness, acne, psoriasis, and eczema.

#### Lipolysis

In the medical and medical-aesthetic fields, Mesotherapy is a procedure that is based on the injection of lipolytic agents into the intermediate layer (meso) of the skin, to emulsify localized fat and eliminate it. It is a technique used to fight cellulite and adipose accumulations and to reshape the body.

# Stimulate hair growth and provide hair care

Phospholipids also play an interesting role in hair care applications. They stimulate the growth of hair epithelial cells and the regeneration of the hair follicle, promoting the anagen phase of the hair, or the growth phase. They also can bind to hair proteins, with keratin, restructuring them and exerting a conditioning and anti-frizz action, or by conveying specific active ingredients for hair care and beauty to the hair.

Another novel ingredient, purified egg oil, a panacea for hair beauty and health, offers anti-fall and anti-dandruff action, as well as the ability to counteract greying of hair. Purified egg yolk proteins offer an excellent additive alternative in hair care preparations to strengthen and shine hair.

### The Future Of Cosmeceuticals Will Be Shaped By Advancements In Lipid-Based Nanotechnology

The use of lipid-based nanotechnology in the cosmeceutical industry is growing and will continue to increase steadily in the personal care industry as it offers advantages of better entrapment, dispersibility, performance, quality, protection, penetration, and patient compliance. The lipid nanoparticles are chemically stable and offer good skin compatibility that can be used for protection against radiation and aging.

Cosmeceuticals based on such nanotechnology are already showing promising results in the therapy of many skin ailments and hair problems. The benefits of targeted delivery, painless remedies, customized therapies, and simplified solutions over conventional therapies are increasing the uptake of products based on this technology. The advancements in technology and the increasing demand for cosmetics have drawn several companies to invest in continuous R&D in the personal care industry. This will continue to spur the growth of products like sunscreens, moisturizers, hair care products, antimicrobials, anti-aging, and anti wrinkle creams.

# Rossari Biotech 'Well Positioned To Benefit From The Global Tailwinds'

## Sunil Chari is the Joint Managing Director of Rossari Biotech Ltd,

with over 30 years of experience in textiles and ancillary chemicals. In an interview with Chemical Engineering World, he talks about driving the company's fruitful exertion to smooth out activities, sustainability, reinforce the product offering, and drive development, propelling the company's growth ahead.

92



**Sunil Chari** Joint Managing Director Rossari Biotech Ltd Tell us about the growth of Rossari Biotech across all served industries during the last year compared to the year before. What has been the biggest takeaway for you from the experience last year & how are you planning to make yourself immune to such market shocks?

Despite the challenges, Rossari's performance in the financial year 2020 towered the previous year's performance. Our growth was primarily driven by a robust and continued uptick in sales in the home, personal care & performance chemicals (HPPC) segment led by higher offtake in hygiene products and antiviral portfolio sales. In addition, normalization in demand and improved consumption across the textile specialty chemicals (TSC) and Animal Health and Nutrition (AHN) business lines assisted overall results. Even on a full year basis, our performance, despite the unprecedented environment, has been resilient and we have ended FY2021 on a strong note, with revenues higher by 18.2% YoY and PAT higher by 22.7% YoY.

The pandemic certainly caused unprecedented disruption across all business sectors and some of our markets faced a demand slump. Despite the inability to meet our customers' f2f in a service-oriented market, the sales and marketing teams were able to still provide high-quality service virtually which reassured our customers a great deal. This period was a test of our agility and ability to adapt to the new normal. We had to pivot and quickly changeover production to health and hygiene products (especially sanitizers). This was a real time demonstration of our flexibility in operations and fungibility of manufacturing capacity. There is a shift in perception towards home and personal care and that will benefit us as we already have a ready portfolio and pipeline of products in this segment. This difficult period taught us the importance of placing people before business and also gave us the opportunity to help some of the communities we operate in. We are grateful to all our colleagues for their unwavering loyalty and hard work that has taken us to the heights of success we are currently witnessing.

In the last year, global players are now trying to de-risk the supply chains from China. In addition to India they are also looking at alternate destinations in South East Asia, Latin America & Eastern Europe. In such a case how can India continue to be an attractive destination for the buyers of specialty chemicals?

The Indian chemical industry is a 36 billion dollar industry which is rapidly enlarging and generating growth opportunities not only within the country but worldwide. The biggest takeaway for industry players with reference to pandemic is to not concentrate their manufacturing needs to a specific country or location. With the focus shifting from China, India stands as the best next alternative in terms of specialty chemicals especially economically as India's labour cost is much lower than that of China. The industries that employ huge amounts of chemicals such as pharma, continue to show rapid growth and that will help make the specialty chemical industry a manufacturing pillar for India. As on today the most observers agree that the biggest export opportunity for Indian chemical companies is in specialties. The global merchant market for specialty chemicals is about USD 700 to 750 billion, and India exports just around 4% of it, while China has around 15% of the market. So there is lot of opportunity for Indian companies.

Government support in terms of providing
a conducive environment for boosting
local production will go a long way in
making India the next manufacturing hub.
Budget 2021 outlined the importance

As on today the most observers agree that the biggest export opportunity for Indian chemical companies is in specialties. The global merchant market for specialty chemicals is about USD 700 to 750 billion, and India exports just around 4% of it, while China has around 15% of the market.

of being self-reliant and it was evident through measures introduced to boost local demand. The exemption on import of duty-free items as an incentive to exporters of 36 garments, leather, and handicraft items is welcome as all of these products are domestically available and will certainly help various MSMEs. We are pleased with the Government's decision to amend customs duty rates on chemicals as it will encourage domestic value addition and remove inversions. The introduction of Mega Investment Textiles Parks (MITRA) scheme will accelerate India's textile industry and make it a global hub; this bodes well for Rossari Biotech as we offer solutions for pre-treatment, dyeing and printing, finishing, as well as specialty chemicals. We look forward to playing a crucial role in charting the growth of India's specialty chemicals sector, backed our Industry 4.0 ready manufacturing facility at Dahej.

To what extent is Indian specialty chemicals industry prepared to meet the global demand? What are the major challenges in the foreseeable future that still need to be addressed in the true sense to make India the most preferred procurement destination for specialty chemicals?

Chemical manufacturing is one of India's oldest and most diversified industries and the country is a leader in segments like dyes and dye intermediates. Interest in India as an alternative to China spiked

### **Export Opportunity Areas**

- China's share of global pharmaceutical exports- 11%, India's share- 4%
- China's share of agrochemical exports- 17%, India's share- 6%
- China's share of dyes and pigments exports- 12%, India's share- 5%

following supply disruptions that arose with the COVID-19 pandemic and India has some inherent growth drivers which includes local demand base. But costlier logistics due to inadequate infrastructure, limited raw material availability, and high power costs are some of the challenges that stand in the way of the robust development of the Chemical Industry.

# How are you scaling up the manufacturing proficiency across production facilities?

Most of Rossari Biotech's products are proudly made in India, at its manufacturing plants located at Silvassa, Dadra & Nagar Haveli with an installed capacity of 120,000 MTPA. Considering the capacity at our Silvassa plant was constrained for products across all our verticals, we decided to debottleneck and factor in the growth opportunities in HPPC as well as Textile Specialty Chemicals by commissioning the Dahej facility with an installed capacity of 132,500 MTPA. Our manufacturing plants are equipped with flexible and interchangeable capacities for our three business lines of HPPC, TSC and AHN. The recently inaugurated Dahej Greenfield Manufacturing Facility is designed and equipped with state-of-theart vessels, control systems and optimum safety provisions in order to handle a wide range of synthesis processes like polymerization, condensation, esterification, resins, specialty emulsions and granulation. In addition, it is well equipped to formulate these chemicals for various industries like home and personal care, textiles, paint and paper, construction etc. We ensure zero discharge of harmful chemicals during our manufacturing process. We have fully operationalized all phases of the Greenfield Manufacturing Facility which will be further augmented by R&D, automation, administration, and other corporate facilities in the coming guarters. The plant enjoys proximity to various ports such as the Hazira port, the upcoming deep-water and multi-cargo port of Dahej thus providing solid cost and logistical advantages.

In one of the key developments during the past quarter, we have fully operationalized our state-of-the-art Greenfield manufacturing facility at Dahej. We have seen a strong ramp-up in utilization levels from this facility in recent months, leading to healthy volumes particularly in the HPPC segment. Going forward, a strong upcoming pipeline of new product **INTERVIEW** 

launches should enable us to sustainably ramp-up utilization levels at this unit over the next 3-4 years. The new Dahej facility is a state-of-the-art automated unit, thus bringing in notable cost-saving advantages and better efficiencies. It is further encouraging that despite facing disruptions owing to Covid-19, our teams were able to make continued progress in launching our new Greenfield Manufacturing facility on schedule. In all, this is a significant milestone for our company, which will provide strong impetus to our overall future growth plans.

Our product portfolio is evolving constantly to cater to the need of the hour. This is a clear testament to our claim of fungibility and adaptability in assets and leadership. Our customercentric approach is a key fundamental value that differentiates us from the rest. Customers are at the heart of everything we do. Through our diversified product portfolio, we continue to provide customised solutions for specific industrial and production requirements to our customers. Our prime objective behind R&D is to continue improving, innovating and expanding the applications of our existing core chemistry, simultaneously focusing on shorter lead times and cost competitiveness.

Tell us more about your Indian and overseas business & plans for the future with the commissioning of the new facility. Overall, we are present in around 17 countries and we continue to expand our footprint. In the HPPC business, our exports were limited due to our capacity constraints. We were struggling to keep up with even the domestic demand but our recently opened Dahej facility will certainly help us achieve our export objectives. We will look soon at the export opportunities and we believe that the U.S.A could be a good market for us.

At Rossari, we realise there is huge potential for us to grow, but our key objective is to grow responsibly. In our quest to translate our visionary goals into on-ground accomplishments, we are focused on consistently nurturing and augmenting our people prowess. We believe we are well positioned to benefit from the global tailwinds, and can well capitalize on the emerging opportunities in the global chemical industry.

We actively seek to expand into the major world markets. We have already begun forays into Bangladesh, Mauritius, Mexico and Turkey. We have established a base in Vietnam, which will help us cater to customers in the APEC region. Our proven competence in producing and supplying innovative and green products will stand us in good stead in this endeavor.

Expanding our presence through: Expansion into new segments in markets where we have a presence,

Expansion into new markets where we

have no historical presence, Achieving the sought-after distinction of being present in all textile manufacturing hubs, Catering to them with standardized products that are certified, accredited and approved to enable global standardization of inputs for large brands and buyers, Developing deep and meaningful relationships with customers across industries we serve by delivering benefits in cost, and quality and sustainability.

Fast adoption of Green products and applications in the textile industry is driven by buyers sourcing from multiple countries. We are witnessing a growing opportunity in gaining accreditation for our products from major buyers and compliance regimes. This provides us with an edge as against marketing products to individual processors as it generates demand pull, rather than having to depend on sales push. Our philosophy of collaborating with our customers to cocreate green products which are tailormade to match their requirements to the highest level will further reinforce our pullmarketing strategy.

What are your thoughts on the PLI scheme getting extended to the chemicals / specialty chemicals sector, how can the manufacturers leverage this?

Considering that the chemical industry is a critical and integral part of the growing Indian economy and present enormous opportunities of attracting investment and creating jobs in the near future, the government's initiative to sanction PLI Scheme for Chemical Manufacturers will help us convert challenges to opportunities and the realign the supply chain from China to India thus making India a major chemical manufacturing hub globally. With the recent opening of our Dahej facility, we are fully geared up to meet the domestic and international demand for high-performance specialty chemicals.

Tell us about the collaboration for R&D with IIT – B & Monash Research Academy to strengthen the innovation pipeline & how do you think this will boost the innovation ecosystem.

Our aim is to focus on a concentrated Research that gives us real time

#### **New Areas of Development**

- Soaps and Detergent -Detergent Enzyme
- Leather Industry Enzyme for Dehairing
- Paints & Coatings -Specialized binders for decorative paints and special additives
- Plastic Industry- Specialized performance chemicals for Plastic

INTERVIEW

output. In 2020, we set up a Centre of Excellence at IIT, Bombay at Powai will help strengthen our R&D infrastructure and develop technologies with higher commercial potential and turn them into reliable solutions through collaborative product development. We plan to bring sustainable solutions to the chemical industry, including eco-friendly concepts for textile processing, sustainable products for cleaning and hygiene. The advanced laboratory enables us to conduct detailed studies of our products and solutions and strengthen our claim on their sustainability. Our strategic partnership with IITB-Monash Research Academy also provides

us the opportunity to conduct long-term research through Ph.D. projects. The intelligence gained will become incubators of revolutionary ideas for future product lines.

We have several innovative offerings in our pipeline at the IIT Powai lab. We are continuously working on product innovation and new products. The trend is that we need to be ahead of the market and for the last 23 years, we have been dealing with competition. We need to be sure and have the direction and products lined up for the growth of the company.

How does Rossari Biotech plan to drive the growth of other key businesses and which are the other areas you plan to diversify into? What are the future plans of the company? At present, we are focusing on building a strong base for newly seeded businesses and filling product gaps in existing businesses. Our vision is to be the leading and most reliable solution provider globally in the sectors of choice with a focus on sustainability. Hence, from a long-term perspective, we have an ongoing strategic focus on sustainable chemistry and integration of newer technology to maintain our leadership position in the specialty chemicals industry in India.

# Fineotex Chemicals Flaring Its 'Star Export House' Status

## Sanjay Tibrewala, the Executive Director of Fineotex Chemical

**Limited** joined the family business of Fineotex Chemicals after completing his specialization in Textile Chemistry in 2002. This coincided with the time when the industry was going through a major transformation in a burgeoning competitive field. The company was initially a contract manufacturer of textile specialties for many international brands and now stands as the fastest growing specialty textile chemical group, awarded by BSE. In an exclusive interview with Chemical Engineering World, he talks about his personal and the company's growth in this high solution-based niche industry.



**Sanjay Tibrewala** Executive Director Fineotex Chemical Limited

May 2021

While our group has continued to be known for our textile specialties, which of course is close to 95 percent of our business, we offer specialty chemicals for other sectors like health and hygiene as well as drilling specialties for the upstream oil and gas sector.

We offer solution-driven products to textile manufacturers for all four stages right from pre-treatment to dyeing to printing and finishing. One has to understand that each of these steps is quite complex and requires 7 to 8 types of different chemicals, which means a total of 25 specialty chemicals are required from start till producing a finished product which comes to around 3 percent of the total cost for the textile manufacturer. This is an extremely niche area that needs a great amount of understanding of the type of machines, substrate, other chemicals used in the manufacturing process, operating temperature, and water quality to offer customized solutions compatible with the process. For example, for two of our key clients, the hardness of water at the manufacturing facility of Balotra in Rajasthan is around 2000 ppm, which is far too high as compared to the water available at Vardaman's manufacturing facility. This will create a different experience of using the same product because of the water hardness levels. This can lead to problems at first or

at any other stage that can cost the textile manufacturer by severely affecting the finished product.

There are many challenges faced by the textile industry on sustainability which are directly /indirectly affecting human health and environment.

Small manufacturers who are not associated with top brands and who are producing locally do not understand the role of sustainability towards clean environment.

Being on a sustainable mission, we are promoting cost effective sustainable products for all, including the local and global customer base.

#### For a very long time, European multinationals dominated the Indian textile specialties market. How has Fineotex Chemicals carved its niche in this highly competitive space?

If you look at the 80s and the 90s, European players dominated this space in India and enjoyed margins up to 400 percent on the products. This was the time when the textile industry was getting competitive and could not match the pricing of MNCs and as a result, the international brands started to shy away from the Indian market. The companies like DOW, BASF, ICI, Bayer divested their textile specialty businesses. Our organization was a contract manufacturer of these chemicals for some of the international brands who procured these from us and sold it under their brand name in Indian as well as global markets. We saw this as a window of opportunity to enter the market with our own brand name and establish our customer and distribution network.

If I look at our journey, in the last 15 years, from 2005 - 2010, we were trying to promote our products to the textile companies across India which I would say was a tough time as we were trying to create our own niche space in the industry. Although, we came with the experience at that time our brand did not have its own identity in the market. Second, the risk of changeover of specialty chemicals for textiles is very high as compared to the rewards or cost savings. These were two big challenges for us to move our chemistries into this very solution-driven textile industry. Gradually we developed our distributor and customer base and started receiving very good response from the textile manufacturers. After the few initial hiccups, I am delighted to share that our key customers include the biggest names in the textile industry in India like Raymonds, Siyarams, Reliance, Bhilwara, Welspun, and more. Globally we have been directly supplying to the textile industry in countries like Brazil, Chile, Argentina, Mexico, Colombia after we stopped supplying to our European clients.

# Tell us about the synergistic partnership with BioTex Malaysia.

BioTex Malaysia was founded and still coowned by Germans who have extensive experience and domain knowledge through their work in Thor & Henkel, who have been the market leaders in the field of textile specialties and were based in Malaysia since 1998. After the currency devaluation in Indonesia and Singapore the company decided to shut down its operations in South East Asia and decided to start its manufacturing facility in 2002.

In 2009 and 2010, we came across them when they were also in the same business cycle chain as we initially were of supplying to European specialties manufacturers and not directly to the customers under their brand name. When we got into business with BioTex, we started buying the products from each other to expand our product portfolios to offer to our customers and later got into synergistic technology partnerships with them.

As we know that Asians have a strong approach to cost-effectiveness and bottom lines and European companies are very good at quality control and setting product standards. Our partnership with them has been a strong turning point in our journey as BioTex's R&D is spearheading our R&D drive very strongly which has enabled us to turn around the company from debtridden to a cash-rich company.

Going forward BioTex has developed many alternate solutions that we have

been bringing to the market and are able to reach our customers across the globe and in India through our strong network of over 100 distributors located in all the textile hubs in the country. BioTex follow the highest standard of ethos and has the Bluesign certification.

Most textile manufacturers face the challenge to deal with tough effluents loaded with chemicals, dyes and have high COD and BOD. As textiles specialties and auxiliaries manufacturer are there any chemistries you are working with to help the manufacturers address this issue?

Undoubtedly, effluents are one of the biggest challenges for textile manufacturers and as the environmental norms are getting stricter, they are now compelled to switch to sustainable chemistries and adopt cleaner processes and reducing water consumption. BioTex has been at the forefront of developing green products that can enable this industry to realize sustainability goals.

A few years back, we offered Chenab Textile Mill, a leading fibre dyeing facility a solution that could help them replace 3 to 4 products used at the pre-treatment stage with a single product. This product enabled them to reduce COD, BOD, processing and labor cost and to improve the quality and tensile strength of yarn because of the reduction in the temperature of a process that could be carried out at 70 degrees Celsius instead of 95 degree Celsius. After getting these results, this case study was a point of reference and we could easily sell this product to other customers in this domain.

Fineotex is aggressively moving in the global markets with all available sustainable technologies for textile chemicals and health and hygiene range.

#### Tell us about the experience of Fineotex to work with different chemistries across a diverse set of industries

As a matter of fact, we love to work with chemistry, which we are doing for so many decades, and continuously try to find more avenues for it in our research facilities. We are bringing more and more values and products for the textile industry at the same time as we are doing the reactions of polymerization, which we do homopolymer, terpolymer, phenylacetate, butyl, acrylic, styrene acrylic, malic acid, malic hydrate, sulphonations, esterification, condensations, etc. In addition to performance chemicals for the textile industry, which is our mainstay, we also supply specialties to the healthcare and hygiene sector and drilling fluids for the upstream oil and gas sector.

There are many chemicals that can be applied to cleaning and hygiene polymers. There are about 40 new products that we have launched for housekeeping and kitchen and have started selling them through our newly established network of distributors and marketing team. Last year we received the FDA certification

(Maharashtra State) for cleaning and hygiene business which is a milestone for us. In the home care segment, we offer polymers for detergents, which is again one of the key areas for our future growth. We have partnered with Johnson Diversey for R&D and started this activity very strongly. We also offer drilling specialties for building viscosity for the oil field drilling chemicals and have a technology partnership with Gumpro, a leading manufacturer in this space.

#### Tell us about the performance during the last year and expansion plans at the recently acquired brownfield facility in Ambernath.

We had a good quarter, we had gone up quite well in the last year. Our top 10 customers have contributed to 33 percent of sales. We reported a net consolidated profit of 11. 22 crores in March 2021 quarter as against Rs. 6.31 crore in the last year.

For the full year, the net profit increases to 225.61% to Rs 42.59 crore in the year 2021 against Rs 13.08 crore last year. Last year we acquired a brownfield facility in Ambarnath, which is at a prime location from the point of view to reach out to our customers from textiles and for other industrial applications. Like all our other manufacturing units, this capacity is very fungible and can be utilized to manufacture customized products for various applications as per the market demand. We have made this investment in line with our future plans to scale up our capacity to also offer other new products in health and hygiene. Though the demand for cleaning products for institutions has declined due to the lockdowns, we intend to be ready with our setup once the markets bounce back to normal. For this facility, there have been no borrowings from the bank.

#### How do you see the markets pan out in the future and opportunities for Indian specialty chemical manufacturers?

Well, looking at India, there are two big prospects which you get excited about. First, everyone in the world wants a substitute for China, for chemicals or textiles. So far, China has been one of the key destinations for textile manufacturing, but now the international companies are looking at diversifying to countries like India, Bangladesh, Vietnam and Pakistan to curb the risks and as cost-effective destinations for textiles. Many European companies and American companies are looking at us and everybody wants to come to India with a plan of tie-ups and joint venture and then growing the company into different levels and supplying pan Asia. India is likely to lead the growth of home textiles and over the next four years producers are likely to double the capacity and the trend is likely to continue. This is something big and will provide a lot of exciting opportunities and ample scope for expansion of our business.

## A Flourishing Market Analyst of The Chemical Industry: ChemAnalyst





Karan Chechi, Research Director, TechSci Research

The chemical industry across the globe is strong, branching out in many directions, supported by an effective and growing research establishment. To keep its competitive edge at run, it must adapt to changing consumer needs with each revolutionary year. In the era where data is regarded as the soul of any business foundation, data credibility and exhaustiveness have been two of the major pain- points that we have heard unanimously from our clients regarding their service providers. To fill the required data gaps; companies resort to the costly option of subscribing to myriad number of web portals or purchase multiple subscriptions from different companies.

That's where ChemAnalyst comes into play. At ChemAnalyst, we provide pricing information for 250+ chemicals under 6 broad categories – Petrochemicals; Polymers & Resins; Elastomers & Rubber; Bulk Chemicals & Fertilizers; Feedstock & Intermediates; and Specialty Chemicals. Our research team is involved in capturing CFR, FOB, Ex-Works prices of nearly all chemical grades in 12 countries worldwide.

**IMPACT FEATURE** 

As we know that numbers are incomplete without supporting facts, our analysts delve into in-depth insights of each market fluctuation to reflect the complete picture of the market to our clients.

ChemAnalyst even consists of a vivid market analysis section which covers a list of major manufacturers constituting 80 percent of the market share, their plant capacities, production levels and operating rates on yearly basis. The company is a cost-effective, one-stop solution for all the market research requirements of a business, irrespective of which part of value chain it falls under. It has been built by a team of over 50 seasoned analysts and is sculpted with exhaustive research considering over fifteen different parameters which provide 360-degree view of the market. Our employee centric approach plays a critical role in offering a better working world to our employees as well as to our clients.

ChemAnalyst team strives for the opportunities to assist the clients who are interested in entering the chemical industry with new ideas and enthusiastic development goals. The team embellishes its presence on crucial platforms where it can assist potential clients. To strengthen its reach, ChemAnalyst remarked its presence at the 11th edition of the mega event "India Chem 2021", organized by the Department of Chemicals and Petrochemicals, in association with the Federation of Indian Chambers of Commerce & Industry (FICCI) as well as ChemTech World.IE, 2021.

Marking its prestigious accomplishment of being a holistic and unique database till date, ChemAnalyst even secured an award for the 'Most Promising New Product' at the National Feather Awards 2021. ■

105

#### For more information

#### ChemAnalyst

Call: 9958299626; +1-6468620089 E-mail: sales@chemanalyst.com Website: www.chemanalyst.com

## Eastman's Fluid Genius Optimizes Heat Transfer System Performance



Fluid Genius

106

Global specialty materials provider Eastman introduces Fluid Genius, a revolutionary new p Global specialty materials provider Eastman introduces Fluid Genius, a revolutionary new patent-pending product that equips engineers and operations managers with predictive insights to optimize heat transfer fluid performance.

Unique to the market, Fluid Genius combines artificial intelligence with half a century of Eastman expertise to monitor and maximize the life cycle of heat transfer fluids for a myriad of system applications.

"With Fluid Genius, Eastman continues the journey to bring digital services to the market," said Aldo Noseda, Eastman vice president and chief information officer. "This solution combines advanced analytics with decades of Eastman experience in heat transfer fluids to create an easy-to-use digital platform to help our customers achieve confidence in operating their heat transfer systems and plan maintenance proactively."

Contact Eastman https://www.eastman.com/

## Seamless Handoff To Mobile Devices For Uninterrupted Productivity

Machine operators can now pass control of their machine seamlessly between the main HMI and their mobile devices. A new feature of B&R's mapp View HMI solution ensures that the controls and information they need are always at their fingertips, so they can move freely around the plant floor as they continue working.

"Until now, HMI terminals have restricted machine operators to working within a certain radius," explains B&R software expert Manuel Sánchez. "If they can't reach the screen, they can't control the machine." B&R's web-based HMI solution now enables them to take control of the



HMI to go

machine with them on their mobile device wherever they need to go. Once the task is complete, they simply pass control back to the main HMI.

The new QRViewer widget available in B&R's mapp View HMI solution generates dynamic QR codes in the machine's user interface. In addition to handing off HMI operation to a smartphone, these codes enable a variety of other convenient new features to optimize machine performance and availability.

In the event of an error in the system, operators can quickly access help documentation, instructional videos, part numbers and more – right on their smartphone. When viewing historical performance data, they can access higherlevel ERP systems and track batches throughout the entire supply chain. The right information, in the right place, at the right time helps keep the machine producing safely with minimal downtime enabling Faster response times.

Machine operators can now hand off control of the

machine from the main HMI to their mobile device and move freely around the plant floor as they continue working.

Contact

**B&R Industrial Automation** www.br-automation.com

## **EnviroGear Jacketed G Series Internal Gear Pumps**



EnviroGear, part of PSG, a Dover company and a global leader in internal gear pumps, is pleased to announce that its G Series Internal Gear Pumps are now available with jacketing. Designed to enhance the G Series Pump's temperature control and stability, these new jacketed pumps are perfectly suited to handle a variety of challenging applications such

108

as carbolic acid, liquid sulfur, roofing manufacturing, general chemicals, bitumen, paint, chocolate, molasses, waxes and heavy fuel oil.

The G Series' jacketing system efficiently heats the seal area and pump internals to maintain process temperature and integrity during operation. This ensures high-freeze point liquids remain in a fluid state when processed through a G Series pump. The jacket also provides faster pump startup and reliability when compared to a cold pump.

"We're very excited to be introducing jacketed G Series Pumps to the EnviroGear product line," said Michael Coburn, EnviroGear Product Manager. "Not only do these new jacketed pumps greatly expand the current application range of EnviroGear G Series pumps, but they also provide a tremendous benefit to manufacturers who prefer to utilize one brand of pump across their entire operation. These manufacturers no longer have to mix and match pump brands based on the application. They now have the option to outfit their entire facility with both non-jacketed and jacketed G Series Pumps from EnviroGear."

The new jacketed pumps are available in cast iron configurations and in sizes G2-55, G2-69, G2-82, G2-133 and G2-222. The pumps come standard with a jacketed bracket to provide temperature control in the bushing area that radiates to the lowvelocity area behind the rotor, a typical cold spot in the pump. Additionally, each pump configuration is available with a jacketed head and relief valve. The G2-55 and G2-133 also have the option for a jacketed case.

Jacketed G Series Pumps introduce temperature control to EnviroGear's already successful heavy-duty pump line. They expand on the established tradition of interchangeability with up to 95% of mechanically sealed, packed and seal-less internal gear pumps currently on the market. New jacketed parts are standardized to ensure competitor interchangeability while the oversized bearing housing and seal chamber allow for seal replacement without pump downtime.

#### Contact **PSG, a Dover Company EnviroGear pumps** https://www.psgdover.com/envirogear
R.N.I. No. 11403/1966 Date of Publication: 29th of every month





# Dynamic Platform to Connect with Chemical Industry Ecosystem Direct Reach to >200,000 Readers across >25 countries



# **Embed Product Video**





Choose the embedded features: insert all embedded features Contact: sales@jasubhai.com

## **Process Industry's Gateway to Indian Market**









# **30<sup>th</sup> International Exhibition and Conferences**

## 22-25 February 2022

Venue: Bombay Exhibition Center, Goregaon (East), Mumbai, India



**Scope for** 

Enzymes

**Specialty Chemicals World Expo 2022** 

Agrochemicals Intermediates

Bulk Drugs & Intermediates

Colorants, Dyes & Pigments

Hygiene & Cleaning Chemicals

Agrochemicals & Crop Protection

**Cosmetics & Personal Care Ingredients** 

Adhesives & Sealants

#### Scope for CHEMTECH + Biopharma World Expo 2022

- Refining & Petrochemical products
- Biotechnologies
- Chemical & Pharma Processing Equipment
- EPC Services
- Automation Technologies
- Environment Solutions
- Water & Wastewater Treatment Technologies
- Pumps & Valves
- Pipes & Fittings
- Packaging Solutions
- Material Handling Systems
- Analytical & Laboratory Technologies
- Consulting Services
- Equipment Fabricators

## **Benefits for Exhibitors**

- ✓ Business Interactions: Meet over 800 exhibitors from across the entire value chain of the chemical process industry
- ✓ **Strategic alliances:** Interact with the entire supply network across the Chemical, Pharma & Biotechnology sectors from a single location
- ✓ Market analysis: Evaluate the Indian consumption market and get feedback with over 25,000 visitors walk-ins over 4 days

### www.chemtech-online.com

# Jasubhaj

#### Organised by: Jasubhai Media Pvt Ltd

Taj Building, 3<sup>rd</sup> Floor, 210, Dr. D N Road, Fort, Mumbai – 400 001, INDIA. **Tel:** +91-22-4037 3636 | **Fax:** +91-22-4037 3635 | **Email:** sales@jasubhai.com

#### Laboratory Chemicals

- Surfactants
- WaterTreatmentChemicals
- Catalysts
- Electronic Chemicals
- Flavours & Fragrances
- Contract Manufacturers

#### FACTS & FIGURES - CHEMTECH WORLD EXPO 2019

612	18962	18	85	923	2150
EXHIBITORS	VISITORS	COUNTRIES	SPEAKERS	DELEGATES	STUDENTS



Ahmedabad / Vadodara - 09820544904 | Bangalore - 09892644177 | Chennai / Coimbatore - 09176963737 Delhi - 09818148551 | Hyderabad / Pune - 09822209183, 09823410712